Greening Peace Operations - Policy and Practice

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Summary

There has been an increase in the number of peace operations in the last decades with mission goals such as contributing to a fair and sustainable development. Since many peace operations are performed in areas where the environment is already under stress, it is crucial not to further deteriorate the situation.

This study examines difficulties in systematically address environmental issues in peace operations. The study pays special attention to the planning and execution phases of an operation. Input to the study has been collected from three main source categories: Swedish experience and knowledge gained from peace operations; written material such as previous studies in this field; and from key personnel in other national defence organisations. In addition a desk study in the form of an inventory of national and international policies and/or related documents has been performed.

Military activities are not exempt from environmental regulations and many countries and troop sending organisations recognise the importance of environmental considerations which can be seen in the development of policies, doctrine and guidelines concerning environmental issues at a strategic level. Their focus is however typically on domestic activities and compliance with national regulations, making the applicability for peace operations somewhat ambiguous. In many strategic defence foresights, the connection between the risks of future conflict and environmental change, including climate changes and energy, is gaining ground. However, this perspective is seldom raised in the environmental policies.

The study concludes that there is insufficient integration of environmental considerations in planning and execution of peace operations. There is also a deficiency in the consideration of environmental issues in critical decisions prior to operations. The low priority of environmental issues might be explained by, among other things, a lacking awareness regarding their importance and unclear areas of responsibility.

Finally, the report gives recommendations for a better integration, i.e. mainstreaming, of environmental considerations in the Swedish Armed Forces peace operations. A comprehensive conflict analysis in strategic planning would for instance identify the role of environmental factors in the conflict. A prerequisite is an increased environmental awareness throughout the organisation, and also that of accomplishing a balanced approach to how environmental considerations could be a mission enabler instead of a strain on limited resources.

Keywords: Environmental considerations, peace operations, environmental policy

Sammanfattning

De senaste decennierna har en markant ökning av freds- och säkerhetsfrämjande insatser ägt rum med syfte att bland annat värna mänskliga rättigheter och bygga en hållbar fred. Ofta genomförs insatserna i regioner där miljön är under stor påfrestning och det är därför av stor vikt att inte ytterligare försämra situationen. Denna studie har undersökt svårigheterna med att systematiskt inkludera miljöaspekter vid internationella insatser med särskilt fokus på planerings- och genomförandefaserna. Underlag har samlats in från tre källkategorier: svenska erfarenheter, tidigare studier på området samt intervjuer med sakkunniga i försvarsorganisationer och multinationella organisationer. Vidare har ett urval av nationella och multinationella miljöpolicys och andra miljödokument studerats.

Studien av dessa dokument visar att de ofta fokuserar på nationella lagkrav avseende miljöskydd, vilket innebär att de endast är vägledande vid internationell verksamhet. Förekomsten av policys är en förutsättning för att miljöfrågor över huvud taget ska beaktas, men är inte tillräckligt för att miljöhänsyn till fullo ska integreras i verksamheten. Föreliggande studie visar att bristande miljöhänsyn i insatsplanering ofta resulterar i ogenomtänkta ad hoc-lösningar, vars brister kan bli kostsamma eller svåra att rätta till i efterhand. Detta har sin förklaring i exempelvis otillräckliga riktlinjer, otydliga ansvarsförhållanden och bristande kunskap om miljöfrågornas betydelse.

I försvarsstrategiska dokument lyfts miljöfrågor som utmaningar för global och regional säkerhet. Det är emellertid sällan som miljöns roll i konflikter och att miljöfaktorer således också kan bidra till att lösa en konflikt tas upp i miljöpolicys. Miljösäkring upplevs ofta av ansvariga som en belastning på redan begränsade resurser utan synbar nytta. Möjligheten till synergier med andra mål, som förbättrad säkerhet och resurseffektiviseringar, behöver därför tydliggöras. Ett sätt att lyfta fram detta är att inkludera miljöaspekterna i strategisk planering och konfliktanalys.

Föreliggande rapport redovisar exempel på de komplexa sambanden mellan miljöfaktorer och militär verksamhet samt hur miljöfrågan har hanterats i några svenska insatser. Vidare läggs också argument fram varför miljöfrågan bör integreras (eng. term mainstreaming) i Försvarsmaktens insatsorganisation och i den långsiktiga försvarsplaneringen. Rekommendationer ges också för hur detta kan ske. En förutsättning är ökad medvetenhet om miljöfrågor och deras betydelse. Det handlar inte om att alltid sätta miljöhänsyn framför andra avväganden, utan om att påvisa att miljösäkring kan integreras i övrig verksamhet vara kostnadseffektivt och vara en framgångsfaktor för att uppnå insatsens mål.

Nyckelord: miljöhänsyn, miljösäkring, miljöpolicy, freds- och säkerhetsfrämjande insatser

Content

Acronyms

ACT	Allied Command Transformation
AMISOM	African Union Mission in Somalia
CF	Canadian Forces
COA	Courses Of Action
CONOPS	Concept of Operations
COPD	Comprehensive Operations Planning Directive
DNBI	Disease and Non-Battle Injuries
DoD	Department of Defence
DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership, Education, Personnel, and Facilities
EAPC	Euro-Atlantic Partnership Council
EBS	Environmental Baseline Study/Survey
EBAO	Effect Based Approach Operations
ESDP	European Security and Defence Policy
EHO	Environmental Health Officer
EHSA	Environmental Health Site Assessment
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EMP	Environmental Management Plan
EP	Environmental Protection
EPWG	Environmental Protection Working Group
EO	Environmental Officer
EU	European Union
EUFOR	European Union Forces
EUFOR ALTHEA	European Union Forces Mission in Bosnia and Herzegovina
EU NAVFOR	European Union Naval Force Somalia
EVA	Environmental Vulnerability Assessment
FHP	Force Health Protection
FMUP	Swedish Armed Forces Development Plan
FRAGO	Fragmentary Order
GHG	Green House Gases
IMPP	Integrated Mission Planning Process

ISAF	International Security Assistance Force
LCA	Life Cycle Analysis
MoD	Ministry of Defence
MONUC	United Nations Organization Mission in DR Congo
MONUSCO	United Nations Organizations Stabilizations Mission in DR Congo
NATO	North Atlantic Treaty Organization
NATO CCMS	NATO Committee on the Challenges of Modern Society
NATO SPS	NATO Science for Peace and Security
NORDCAPS	Nordic Coordinated Arrangement for Military Peace Support
OECD	Organisation for Economic Co-operation and Development
OECD/DAC	Organisation for Economic Co-operation and Development/Development Assistance Committee
OPLAN	Operation Plan
OPORD	Operation Order
PCEA	Post-conflict Environmental Assessment
SEA	Strategic Environmental Assessment
SHAPE	Supreme Headquarters Allied Powers Europe
SOP	Standard Operating Procedure
STANAG	NATO Standardization Agreement
SOR	Statement of Requirements
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UN DFS	United Nations Department of Field Support
UN DPA	United Nations Department of Political Affairs
UN DPKO	United Nations Department of Peacekeeping Operations
UNEP	United Nations Environment Programme
UNMIS	United Nations Mission in Sudan
UNPROFOR	United Nations Protection Force
UNSC	United Nations Security Council
UNSOA	United Nations Support Mission to AMISOM
US AEPI	US Army Environmental Policy Institute

Foreword

This report is a product of the Swedish Defence Research Agency (FOI) and is one of the deliverables from a three-year research project addressing environmental impact of military operations. The project was commissioned by the Swedish Armed Forces and started in January 2010. The overall aim of the project is to support the Swedish Armed Forces in reducing the environmental footprint from their operations.

Moreover, the report addresses environmental policies and practices in some selected countries (viz. the Nordic countries, the United States, the Netherlands and Canada). Organisations such as EU, UN and NATO have also bee studied. The report aims first and foremost to describe what policies different countries and organisations have concerning environmental issues, for their defence organisations and to what extent these have been implemented in the planning and execution of military operations. One task is to explore how environmental considerations are motivated and included in the overall planning and execution phase of an operation.

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1 Introduction

The environment has always had an influence on military operations and vice versa. On one hand with respect to the military's own supply chains of delivering commodities to theatre and reducing its own vulnerability and dependence on the receiving nation infrastructure. On the other hand, military operations, by their very nature, may be destructive to the natural environment and the human inhabitants.

The Swedish Armed Forces began to explicitly address the environmental impacts of their activities in the management of national military bases in the mid-1990s. At the time research projects were initiated, mainly focusing on environmental risk assessments for the downsizing of installations and the environmental impact from the use, storage and dispersion of defence related contaminants, such as heavy metals and different kinds of explosives.

Although environmental aspects of military activities often are associated with ordnance and vehicle use, fuel handling etcetera, there are some less obvious, intricate connections between environmental aspects, security issues and accomplishment of the mission goal. Contemporary peace operations are often performed in areas where the environment is already under stress. In addition to a "do no harm" approach,[1] it is likely that environmental issues in some way play a role in the conflict and thus possibly in the solution of it.

Military commanders are indeed required to exercise judgment in the balance of applying violence and limit collateral damage to the extent possible.[2] It is crucial to avoid unintended consequences[3] from the deployment itself, because these may in turn enhance or fuel new tensions - winning the war is one thing, whereas winning the peace is quite another.[4] Issues such as natural resource management, waste management and energy consumption should therefore be ever so important to include in the operational planning and execution.[5]

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1 Essentially that donor interventions should not undermine state building processes. See further e.g. OECD DAC 2010.

2 Geneva Convention 1949 including additional protocols 1977a and b; and 2005

3 Hull *et al.* 2009

4 Chiarelli and Michaelis 2005

5 UNEP 2011

The economy and society are intimately dependent upon a healthy environment, which is reflected in the concept of sustainability.[6] Goods and services provided by ecosystems, like productive land and clean water, are necessary for livelihood and health. Conversely, environmental damage can threaten livelihoods and development. The notion that a secure and sustainable environmental setting is a prerequisite for a stable peace is gaining ground.[7] Furthermore, the notion that sustainability enhances stabilisation, as stated by the former United Nations Secretary-General, and even national security interests, is gaining increased acceptance.[8] Hence, incorporating environmental considerations in the whole life cycle of an operation could be an important key in achieving mission success.

1.1 Problem statement

There is a frustration with the deficiencies in environmental considerations in planning and execution of operations, among personnel dedicated to the task. This is demonstrated in dialogues over the years between the authors and environmental professionals at various levels in their organisations and has further been confirmed by briefings given at conferences, working group meetings and during training opportunities.

Collected experience and knowledge on environmental considerations in peace operations is ample. However, much of the information is fragmented between individual parties due to a lack of documentation as well as communication. Experiences suggest that much work remains before environmental aspects are fully incorporated in the life cycle of an operation.

Part of the current knowledge gap is to what extent national and multinational policy, doctrine and guidance documents are influencing the planning and execution of peace operations.

Establishing and validating information on the above is needed in order to draw any solid conclusions on the reasons for the sometimes inadequate handling of environmental issues. This is vital in order to identify where to focus future resources to improve the situation.

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[6] According to OECD, sustainability is defined as the continuation of benefits from a development intervention after major assistance has been completed. It includes the probability of continued long term benefits and resilience to risk over time and includes financial, institutional, human resource, management and other elements

[7] UN 2007

[8] Government Offices of Sweden 2009; Ban 2007; Waleij *et al.* 2008

1.2 Aims and objectives

This study attempts to shed some light on a field where there is a vast amount of different knowledge and experiences, however not yet fully documented, analysed or readily available in open sources. The intention of this study is to collect experiences, discuss possible causes and potential solutions.

The report also addresses environmental policies and practices within national defence ministries/departments or armed forces as well as multinational peace operation organisations. This is to investigate if policies state why, and provide sufficient guidance on how, to integrate environmental considerations in the life cycle of a peace operation.

The report seeks to answer the following questions

- Which environmental policies or other strategic or high level documents in the field of military operations exist, and are peace operations specifically addressed?
- What are the main difficulties with handling environmental issues in peace operations?
- What could be done to overcome the difficulties encountered, enabling environmental considerations to be “operationalised”?

Parties who are interested in this research are likely to be engaged in strategic or operational planning of peace operations, or otherwise involved with aspects concerning the development of policies, procedures and guidance within this field. The information will be particularly useful for individuals working with environmental issues concerning peace operations. The content of this report is primarily directed to a reader with experience from working with environmental considerations in different defence organisations in general, or in peace operations in specific.

1.3 Scope and limitations/boundaries

This study examines difficulties in systematically addressing environmental issues in peace operations with special attention to the planning and execution phases of an operation (figure 1).

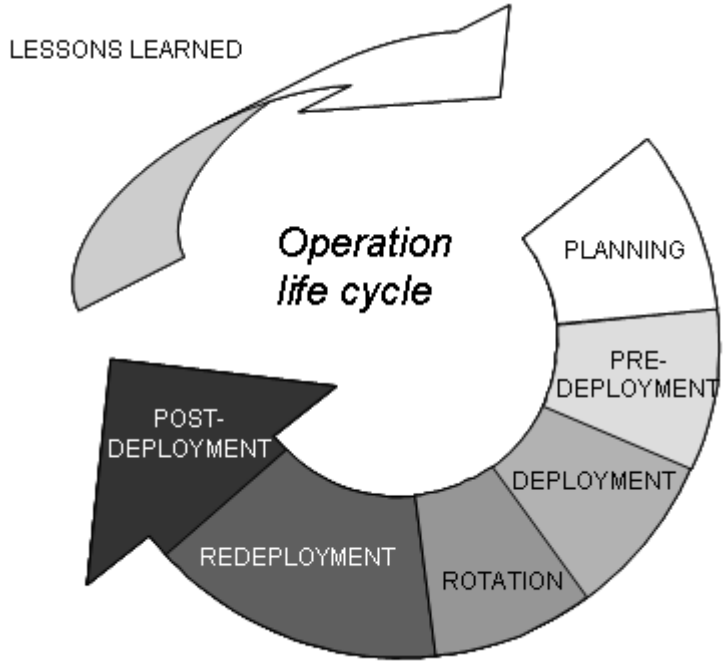

Figure 1. A schematic picture illustrating the different phases of a peace operation. This study focuses on the planning and execution (pre-deployment, deployment, rotation and redeployment) phases.

The report does not seek to answer all questions regarding environmental issues in peace operations, but rather to describe key issues identified. We will not discuss in specific detail the different tools that can be used at the operational and tactical level in order to meet environmental requirements. These are dealt with elsewhere.[9]

Questions and perspectives associated with the Defence Administration environmental policies and other high level documents in general are explored, with a special focus on what is expressed regarding peace operations. The specific countries selected for this report are Norway, Finland, Denmark, Belgium, the Netherlands, Germany, Canada, United Kingdom and the United States. The organisations studied are the European Union (EU), the United Nations (UN) and the North Atlantic Treaty Organization (NATO).

It is important to note that this study focuses on environmental risks in terms of the *risks to the environment from the operation* and not on potential environ-

[9] Edlund *et al.* 2009; Waleij *et al.* 2010a; and Bosetti *et al.* 2008

mental risks to deployed personnel[10], even if these areas are interrelated when it comes to e.g. waste and water management.[11] Furthermore, the study attends to environmental aspects during the life cycle of an operation, not a full life cycle of a material or system, cf. life cycle analysis (LCA).

1.4 Terms and definitions

Nations as well as organisations perceive "the environment" in various ways. For instance, in the Swedish Environmental Code[12], the environment can be interpreted as people, animals, plants, land, water, air, the climate, the landscape and the cultural environment, the management of land, water and the physical environment in general, and other management of materials, raw materials and energy.

In the NATO Glossary of terms and definitions[13] the word "environment" is mentioned no less than 35 times but only one refers to the environment in the sense that it is discussed in this report, i.e. *the surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation*.

Many terms are frequently used that need to be further explained and defined in this context. These terms are discussed further in appendix 1. Some other terms are also described, which are often used when discussing environmental aspects of military operations.

For the purpose of this report, the term *environmental consideration* is used to describe measures that aim at, but are not solely focused on, the more narrow term *environmental protection* (EP). Environmental protection is defined (by NATO) as "Measures and controls to prevent damage and degradation of the environment, including the sustainability of its living resources."[14] In the NATO policy context it is clearly expressed that "EP is protection of the environment,

[10] These risks are generally handled within the domain of "*Force health protection"* which is defined (by NATO) as "Measures and means to minimise the vulnerability of personnel, facilities, materiel, operations and activities from threats and hazards in order to preserve freedom of action and operational effectiveness thereby contributing to mission success." [AJP-3.13 Allied Joint Doctrine for Force Protection (FP)]

[11] The NATO/SPS project "The Effects of Environmental Conditions on Soldiers", co-directed by Canada, Sweden and the United States is one example on a project where the environmental issues and health issues are dealt with in an integrated way. See for instance URL <www.eihh.foi.se>

[12] The Swedish Environmental Code 2000

[13] NATO 2010b

[14] NATO 2010b

not protection from the environment" [15]. However, NATO doctrine states that "Environmental protection may also encompass some aspects of health and safety of the personnel under the commander's responsibility."[16] The UN system on the other hand, essentially avoids using *environmental protection* or *environmental considerations*, but rather chooses to use *environmental issues*, to "comply with the environmental policy or measures to implement the environmental policy".[17]

Environmental stewardship is used to describe the behavioural part of the equation, i.e. the tenet that safeguarding of the environment is each individual's responsibility, albeit placing the responsibility at the command level. Furthermore, *environmental management* addresses the systematic manner where such considerations and stewardship will be executed in a traceable and accountable manner (due diligence). At the very highest policy level, UN puts emphasis on environmental management systems (EMS) as the overarching framework for addressing environmental issues in their operations.[18] NATO is also working in this direction.[19]

1.5 Report structure and disposition

This report is divided into eight major sections: (1) a brief introduction and problem statement; (2) a description of methods used, and existing knowledge/research gaps; (3) a situation review; (4) summary of Swedish experiences from international operations; (5) previous studies relevant to this study; (6) results from semi-structured interviews; (7) discussion; (8) conclusions and recommendations. Chapters 3-7 are introduced by a box summarising its scope.

Sidebars are used throughout the report, to accentuate specific issues.

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[15] NATO 2003a

[16] NATO 2008. Environmental protection and force health protection are indeed two side of the same coin. Force health protection will benefit significantly from the integration of environmental considerations in the conduct of operations.

[17] UN environmental expertise

[18] UN DPKO 2009a; NATO 2003a

[19] NATO 2008

2 Method

Input to this study has been collected from three main source categories: Swedish experience and knowledge gained from peace operations; previous studies in this field; and from key personnel in other national defence organisations as well as multinational peace operation organisations. In addition a desk study in the form of an inventory of official (open source) policies and/or related documents has been performed.

The Swedish Armed Forces' Headquarters, the Centre for Defence Medicine, the Swedish Armed Forces Logistics, and the Swedish Defence Research Agency (FOI) have acquired substantial experience from supporting peace operations in the environmental field. Moreover, the deployed personnel have an extensive knowledge of the reality in the operational environment. These experiences are the basis for much of the discussions in the report, and they are compared with the lessons observed by other military actors in peace operations.

To include the findings of other studies on this subject a selection of reports have been chosen for review. These reports are among the most recently written by actors representing some of the nations selected for the study. It should be noted that this review has no aspiration on being a full review, covering everything published in the field, since this is not within the scope for this study. Furthermore, there may be studies performed that are unknown to us and/or have not been made publically available. We have tried to deal with this potential deficiency by asking the respondents in the interviews to suggest other documents and references that might be valuable for inclusion.

In addition, semi-structured interviews with knowledgeable individuals from selected countries and multinational peace operation organisations have been performed (appendix 2). The participants were asked to answer a set of questions regarding present environmental policies and other strategic documents as well as current status/potential success factors regarding their implementation (appendix 3 and chapter 6). Information has also been extracted from discussions during personal meetings.

A number of nations were selected for this study since they were judged to have relevance for the Swedish Armed Forces for different reasons, e.g. through an established defence cooperation, having a similar organisation or a known documented framework for environmental considerations in peace operations. It is important to note that this does not by any means imply that other nations are irrelevant to study. Naturally, many other nations and actors are extensively involved in peace operations (e.g. France, Italy, and the African Union) and/or also have environmental policies and practices for military operations and these

are acknowledged. Unfortunately, within the boundaries of this study it has only been possible to include a limited number of nations.

Organisations such as EU, UN and NATO are also of specific importance in relations to peace operations, since troop contributing nations (TCNs)[20] such as Sweden may be obliged to comply with policies developed by these organisations. NATO is also interesting in the sense that work specifically aimed at defence environmental issues has been performed in several working groups, technical groups and projects addressing environmental protection and environmental security including climate change.[21] Furthermore several countries including Sweden have, to varying degrees, chosen to adopt the NATO structure and many nations have implemented NATO environmental policy and doctrine in their own organisations.

The inventory of policies and other strategic documents has been performed by reviewing open source information from the defence actors or multinational peace operation organisations. It is always difficult to draw conclusions for the reasons behind a lack of information relevant to studies like this in open sources. It may be due to an actual absence of documentation or even just due to lack of availability (an issue compounded further by the use of different languages). It is relatively common that these kinds of documents are categorised as so called "grey literature", meaning that they are not distributed or indexed by commercial publishers or other public channels. This means that even if they are regarded as open source information they are difficult to obtain. Finding these documents often requires personal contacts within the foreign military organisations and/or active participation in the international military environmental community.

It is recognised and acknowledged that valuable contributions have been sourced from many individuals from the studied countries and organisations, providing us with relevant documentation to complement the list of reference literature.

[20] UN uses Troop Contributing Countries (TCC)

[21] E.g. the NATO Environmental Protection Working Group

3 Situation review

There is a surge in peace operations. The mandates of today's peace operations are also broader than they have ever been. This may implicate that the military will to a larger extent be included in tasks and issues of – for the military - non-traditional character and also taking non traditional environmental issues into consideration. Complex environmental questions may arise during a peace operation. Since relations between for instance security and the environment are very intricate, they require careful and considered management. Some of these issues may be identified in an early stage of the planning of an operation whilst some are more or less discovered on site. It is crucial that the operation itself does not contribute to exacerbate the environmental situation in an area of operation, thus, not dealing with environmental aspects is not an option.

Environmental policies and doctrine are a starting point for reinforcing environmental consideration but they need to be accompanied with more instructive documents and tools, such as for instance an EMS. Relevant documents, such as environmental guidelines, should also be included in the environmental annex to the Operation Plan (OPLAN). Still, there are no fixed solutions to issues and each must be assessed on their merit. The response should always be considered in the context of the sensitivity of the local environment and its effect on ecosystems and human populations.

There is a surge in peace operations. Since 1948 UN has launched 64 peace operations and in addition, the number of peace operations launched by non UN actors including NATO, EU and the African Union has doubled in the past decade. Since 2000 global peacekeeping deployments have grown by 30 %.[22]

All ten nations studied in this report are UN members; seven of them are members of EU (Canada, Norway, and the United States excluded) and eight are NATO members (Sweden and Finland excluded), see table 1. All studied nations participate actively in peace operations although mainly through non-UN commissioned operations such as the International Security Assistance Force (ISAF). In 2009, all but Finland were among the top 20 financial contributors to UN peacekeeping operations but none were among the top 20 troop contributors.[23, 24]

[22] Center on International Cooperation 2010

[23] Center on International Cooperation 2010

[24] In 2009, Pakistan, Bangladesh, and India were the top three largest troop contributors to UN missions. Of the European and North American nations, only France and Italy were among the top 20 financial contributors to UN peacekeeping operations as well as among the top 20 troop contributors.

Table 1. The studied nations' affiliation with multinational organisations, i.e. EU, UN and/or NATO (* indicates Partnership for Peace). (Abbreviations for nations are the ones used by NATO.)

	BEL	CAN	DEU	DNK	GBR	NLD	NOR	USA	FIN	SWE
EU	√	-	√	√	√	√	-	-	√	√
UN	√	√	√	√	√	√	√	√	√	√
NATO	√	√	√	√	√	√	√	√	-*	-*

Swedish participation in peace support and security-building operations must always be founded in international law, commonly mandated by the UN Security Council (UNSC). Swedish involvement in international peace operations is ultimately intended to contribute to maintaining international peace and security and consequently to facilitate fair and sustainable global development.[25] This approach includes an environmental dimension as well.[26]

The fact that most industrialized countries choose to participate mostly in EU-led and NATO-led operations where the security situation may be more constrained than in some UN peace operations, indicates that there should be incentives for a increased self sufficiency and hence more resource efficiency and less environmental damaging practices (example 2).

3.1 Peace operations

Contemporary conflicts show some major differences from the traditional ones.[27] While there used to be primarily state actors having monopoly over the use of force within their borders, there is now a rise in non-state actors having access to small arms. This has resulted in lower intensity conflicts over longer periods, with civilians being targeted. Peace operations have changed accordingly with an increased involvement of police and civilians, instead of the previously mostly lightly armed (or unarmed) UN military forces.

Hence, today's peace operations have more complex mandates, not only limited to increasing security but also involving (re)construction and the subsequent development of a stable society. As a result the complexity in terms of the number and types of actors involved has also increased – and we now see both internal and external actors, including for example governments, civil society, the private sector and international agencies aiming at working together in a coherent and coordinated effort. These actors undertake a broad range of programmes that

[25] Swedish Ministry for Foreign Affairs 2008

[26] Sustainable development includes according to the World Commission 1987 three pillars; economical, social, and environmental

[27] Arnush 2007

are designed to encompass not only specific aspects of the security, political, socio-economic and reconciliation perspectives but in many cases the whole programme and in this respect their actual involvement in terms of time within a peace operation varies considerable.

Military and civilian organisations work in different ways, which is challenging for an efficient integration.[28] The need for more integrated approaches is expected to remain or increase as we see more complex operations in e.g. natural disasters[29] where civilian and military actors need to operate together.

3.1.1 Comprehensive approach

To address the need for better and increased coordination between different actors in an operation UN uses the term *integrated mission*[30] and refers to the integration of the various military, police and civilian dimensions of a peace operation. A coherent approach to produce a comprehensive and coordinated UN system-wide effort is expected to have a more efficient and sustainable impact on the peace process.[31] The concept thus refers to a type of mission where there are processes, mechanisms and structures in place to achieve a common strategic objective, through a comprehensive operational approach, among a number of actors. However, integration does not imply the incorporation of one entity into another or subsuming one entity under the management control and command of another. Instead, it refers to the processes, mechanisms and structures that connect these various UN entities into a single interlinked, UN country-level system. The objectives are harmonisation, alignment and coherence with a view to greater overall efficiency and effectiveness. The Integrated Mission Planning Process (IMPP) is the authoritative basis for the planning of integrated missions.[32]

NATO, and many other actors, uses the concept of a *comprehensive approach*, which also includes activities to create a stable and peaceful development of the society. There are different definitions of the concept of a comprehensive approach but they all imply a higher degree of integration, coordination and cooperation amongst the many (types of) actors involved. Within a national perspective, the term is associated with expressions such as “whole of government approaches” or “interdepartmental cooperation”, while terms from multinational or regional organisations can be “multidimensional” and “multifunctional”.[33]

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[28] Egnell 2008

[29] Dreborg *et al.* 2009

[30] UN 2005

[31] de Coning 2007

[32] UN 2006

[33] The comprehensive approach and its implementation have been studied by FOI, e.g. Nilsson *et al.* 2009 and Hull 2008

Further, many nations including the Swedish Armed Forces, use the concept of an Effect-Based Approach to Operations (EBAOs) as the military contribution to a strategic comprehensive approach.

For development of the Swedish Armed Forces EBAO, strategic processes relating to multifunctional crisis management have been studied.[34] They are generally found to consist of four building blocks:

1. Analysis and assessment of the situation
2. Crafting and deciding upon desired aims and objectives (ends)
3. Planning for delivery of the desired aims and objectives (ways and means)
4. Monitoring and evaluating progress

The purpose of the first block is to identify what is needed to address the conflict and to understand the context for the intervention, in terms of the primary causes of conflict and peace at various levels; key stakeholders who are affected by or influence the evolution of the conflict; the context in which conflict and peace building is taking place (political, economic, social etc); and an assessment of the dynamics of the conflict, how it might evolve into the future and what opportunities exist for interrupting escalation.[35] To gain a comprehensive understanding of the conflict situation is a prerequisite to be able to decide upon appropriate actions in block 2 and 3.

Purposeful assessment is a key part of the Swedish Armed Forces EBAO concept. The idea of this approach to measure progress is to consider all effects that may have an impact upon accomplishment of mission goals, and not just effects considered during planning. This will include also assessment of the slow processes in the community.[36]

3.2 Peace operations and the environment

Military operations and the environment influence each other in a number of direct and indirect ways and some examples are given in the following sections.

Traditionally, the principle drivers in the military community for addressing environmental issues in an operational context have been associated with force health protection issues and (the risk for) legal claims. Environmental surveys are often performed with the main focus to protect soldier health and capabilities and not primarily with the focus of protecting the environment per se. The need for

[34] Derblom 2007

[35] OECD 2008

[36] Frelin 2009, building on OECD 2008

pre- and post-deployment surveys such as environmental baseline studies (EBS)[37] has been motivated by e.g. the ability to prove the type of pollution present in the area proposed for base camp establishment. This is in order to avoid future compensation claims, in case of the presence of pollution. Additionally, the use of EBS also provides an opportunity to advice on potential health risks as a result from pollution.[38]

3.2.1 The environment as a victim of the operation

Military activities and operations, by their very nature, may be destructive to the natural environment and the humans who inhabit it[39]. Environmental impacts resulting from armed conflicts have been covered by several studies[40] whereas the impacts on the environment as a result of peace operations are a comparably newer field. Although armed conflicts often cause more severe collateral damage than peace operations, such as destruction of facilities and visible harm to nature, these two are in many aspects similar in terms of direct and indirect impact. Environmental impacts from peace operations activities depend on many factors for instance, the duration and phase of the operation and may include deterioration of air, soil and groundwater quality (example 1) as well as impacts on natural, cultural and historical resources. In addition, every operation area is unique and all have specific vulnerabilities in terms of natural environmental as well as cultural values. Some consequences of military activities are very immediate and visual as for instance the NATO bombings of the Pancevo industrial complex in northern Serbia, where substantial amounts of chemicals were released to the Danube river.[41] Others can be more subtle and not immediately obvious. The resilience of the environment at each specific location has paramount importance for how severe and long lasting the consequences actually will be. For instance, the vast amounts of chemicals released in the Pancevo bomb-

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[37] Both *study* and *survey* are used

[38] To identify environmental, health, and safety conditions that may pose health risks to deployed personnel an environmental health site assessment (EHSA) should be performed. In light of the interrelationship between elements of the EBS and EHSA, combining these two is advisable, and their execution should be closely coordinated.

[39] Military activities may result in negative as well as positive impact. For instance, in developed countries the military often are important protectors of open land spaces. Subjecting land, sea and air space exclusively for military use such as exercises protects these areas from agricultural or industrial use as well as other types of encroachment that have destroyed wilderness places in the past. In addition, it has been argued (see e.g. Brauer 2009) that there in fact may be "benefits of war" and "costs of peace", from a strict perspective of nature. War does not always affect nature in a detrimental way, and peacetime activities may be very harmful for the natural environment. Not in any way does this imply that war or armed conflict is a desirable situation, but it should be noted once again how complex the relations in this area may be, and that there indeed generally is more than meets the eye.

[40] Austin and Bruch 2000; Brauer 2009; Waleij *et al.* 2005a; UNEP 2003; UNEP 2007; and UNEP and UNCHS 1999

[41] UNEP and UNCHS 1999

ings, which were given large attention in the press, was however judged by the United Nations Post Conflict Environment Assessment Team not to be likely to cause the ecological catastrophe feared. Correspondingly, perceived "smaller issues" may have considerably more severe consequences. For instance, a minor - but wrongly constructed and located - waste deposit that is left unmanaged may result in damaged ground water resources and have huge effects for the livelihood in a water stressed area.

Example 1: Pollution associated with military installations

A typical soil contamination profile on a military installation is shown below. Most spills and contaminations are related to petroleum, oil and lubricant handling at for instance garages or workshops, training facilities for fire and rescue personnel or remaining of explosives and lead at firing ranges and such affected areas are to be remediated before camp closure.[42]

Typical pollution associated to military activities

Type of pollution	Source
Petroleum, oil, lubricants	Workshops, garages, fuel stations
Diesel	Generators
Explosives	Firing ranges
Heavy metals (e.g. Pb, Cu, Cr, Zn)	Firing ranges

3.2.2 The resource - security nexus

The need for supply chains for commodities such as water, fuel, food, and construction material to theatre is paramount to any military operation. However, the supply chain comes with a cost, in money and in some cases also in lives (example 2). The costs associated with transporting necessary resources to base camps and forward operating bases are enormous. The final costs for purchased fuel may have increased up to 400 times before it arrives to its final destination at a camp. The costs are partly associated with the fact that locations are often remote and/or strongly influenced by the security situation. This may not only demand a substantial amount of force protection, but also the actual rates of transport are increased. The motivation for becoming more resource efficient, and hence more self sufficient as well as less environmentally damaging, is therefore quite self-evident.

[42] Edlund 2009

Example 2: Resupply casualties in Afghanistan

Resupply of fuel and drinking water for troops deployed in contingency operations costs lives. For instance, a so called casualty factor for fuel resupply for the US Operation Enduring Freedom (OEF) in Afghanistan has been calculated to be 0.042; that is one soldier or civilian killed or wounded for every 24th fuel-related resupply convoy. For potable water one soldier or civilian was killed or wounded for every 34th resupply convoy. This situation, where fuel and other resupply convoys are targeted, has also been observed in complex peace operations e.g. ISAF. During June to September 2010 more than 145 civilian truck drivers and guards were in attacks on NATO convoys and 123 vehicles were destroyed.[43]

3.2.3 The environmental impact on the operation

Disease and other non-battle injuries (DNBI) have historically accounted for the vast majority of casualties in almost all military operations.[44] Naturally occurring hazards include those caused by endemic disease, environmental hazards (example 3) [45] or climate conditions. Harsh weather, e.g. sand storms or extreme humidity, put high demands on material as well as on personnel. Future environmental constraints, including the effects of climate change or water scarcity will also have the potential to significantly affect future peace operations.[46]

[43] US AEPI 2009; McGirk 2009

[44] Garfield and Neugut 1997

[45] Department of National Defence Canada 2000

[46] NATO 2010a

Example 3: Canadian Forces experiences from bauxite exposure

In 1993-94, the Canadian Forces operation Harmony served in Croatia in support of the United Nations Protection Force (UNPROFOR). After the deployment, concerns were raised about the possibility that troops had been exposed to contaminants. The perceived exposure stemmed from bauxite-rich sand; "red mud" that had been used as filling material in sandbags used for force protection. Red mud is created as a by-product in aluminium manufacturing, and when it dries a red dust is created. These allegations prompted the launch of a Board of Inquiry. During the fall of 1999, board members listened to testimony from witnesses, commissioned studies on diverse topics such as combat stress and command and control, and collected and analysed thousands of documents, including battalion war diaries. The board was unable to conclude with certainty that exposure to the "red dust" and other suspected contaminants were the specific cause of the illnesses. However, the board concluded that many Canadian soldiers went to Croatia healthy and came back sick, or became sick after they returned. In the board's view, they became sick as a result of their service, and regardless of the nature or specific causes of their illnesses. The Canadian Forces thus had an obligation to provide for their support and care. To prevent contamination in future missions, they therefore recommended that the Canadian Forces take measures to better protect deployed personnel by improving environmental reconnaissance and monitoring for all missions. The incident changed the Canadian Army Doctrine and a directive dealing exclusively with environmental and industrial health hazards (EIHH) has been developed as a direct result from a recommendation in the board's final report.[47]

3.2.4 Environment and conflict relations

In many cases peace operations are performed in areas where the environmental situation may already be in a critical state, as a result of factors other than the conflict. Furthermore, looking back over the past sixty years, at least forty percent of all intrastate conflicts can be associated with natural resources, such as cocoa in Ivory Coast, coltan and gold in DR Congo, charcoal and fish in Somalia and diamonds in Sierra Leone.[48]

Environmental considerations are hence not only a matter of caring for the environment because it is "the right thing to do". Degrading the environment or competing for limited natural resources may for instance fuel natural resources related tensions in the area of operation, which in turn could seriously hamper any post-conflict peace-building effort. Example 4 illustrates the very complex environmental security context many operational theatres offer, and that needs to be considered.[49]

[47] Department of National Defence Canada 2000

[48] UNEP 2009

[49] Personal communication senior engineer UN; Abdiaziz 2010

Example 4: Mogadishu, Somalia - charcoal in the stoves

The charcoal industry in Somalia puts a heavy pressure on forests, e.g. acacia trees in southern Somalia, and forests are disappearing fast as charcoal burners cut down big trees. The process in itself is also associated with pollution of air and negative health effects. Furthermore, illegal charcoal exports to the Gulf States are a big source of income for rebel groups in Somalia. UN supports the African Union Mission in Somalia (AMISOM) through UNSOA (United Nations Support Mission to AMISOM). UN, through its logistic base in Mogadishu, supports AMISOM with cooking utilities including stoves that are fuelled with alternatives to charcoal. The forces of AMISOM in Mogadishu have experienced that by utilising and buying charcoal from Al-Shabab-supported providers in Mogadishu, they gain a certain level of security. Hence they prefer the traditional cooking utilities, although long-term this is counter to the mission goals.

An alarming example when improper and/or insufficient environmental actions had serious security consequences is the clashes in Haiti (example 5). The turbulence started in October 2010 due to a cholera outbreak in the country. UN forces were accused of being responsible for introducing the disease, resulting in violent protests[50] and mistrust against UN personnel[51]. Since a lost credibility is hard to regain, it is of great importance that it is not lost in the first place[52]. The legitimacy and credibility of the operation should not be underestimated, as it is an important factor for mission success. In this respect, environmental issues are important, as shown in a number of public-opinion surveys undertaken in post-conflict Iraq. Many of the surveys mentioned infrastructure and/or environmental issues as prioritised areas[53]. Access to electricity, clean water, clean air and operating sewage and waste management systems were emphasised. Results from surveys like this should be looked upon with a certain level of carefulness; they however indicate the importance of environmental issues for the local population and the connection to operation credibility and legitimacy.[54] The result also underlines the importance of including environmental considerations in conflict analyses, estimations of operational efficiency and mapping of development trends in the area of operation.

[50] BBC News 2010; Katz 2010a

[51] Katz 2010b

[52] UN 2008a

[53] Mosher *et al.* 2008. In the survey, the local population in different regions of Iraq was asked to answer a set a questions 1) issues of importance for Iraq 2) the role of environmental issues 3) to what extent coalition forces have acted to improve the issues of highest importance to the local population.

[54] Mosher *et al.* 2008. An increased confidence and trust for the operation among the local population as a result of recovery and reconstruction activities may also result in other effects such as a decreased recruitment base for rebels. This has been identified by American commanders in Iraq and Afghanistan, where the connection between reconstruction efforts and a diminished recruitment base for rebellious movements has been stressed.

Example 5: Haiti - when good intentions go bad

The turmoil in the streets of the cities in Haiti due to the cholera outbreak in October 2010 is an alarming example on how environmental considerations and the general conception of these must be addressed. As the disease was spreading; rumours and opinions that the bacteria came from Asian troops participating in the UN operation in the country flourished. This resulted in clashes and open fire in the streets. This illustrates the complexity of the problem very clearly; firstly, the insufficient management of waste water from the UN base itself - in violation with the DPKO/DFS environmental policy, and secondly, the population's perception of the mis-management.

If the waste water is not handled properly and discharged in water courses or ditches – unfortunately not an uncommon sight - this may be a cause for spreading of diseases with security implications as one result, not to mention the health implications. This was a case of improper waste water handling. If the waste water is managed properly *but* there is a *perception* that this is not the case; the scenario may be similar. The perception of foreign troops spreading diseases will most likely have effects on the security situation in the area for a long period of time.

The case with the cholera outbreak in Haiti is a striking example on a non-compliance with paragraph 39 in the UN DPKO/DFS environmental policy. As of 15 March 2011, it was not confirmed whether the bacteria actually came from the UN troops deployed in the country, still the waste water has not been treated in accordance with UN's own policy, which states that "the Director of Mission Support/Chief of Mission Support will take measures to ensure that there will be no discharge of waste waters directly into streams, rivers or other bodies of water without prior treatment. Sewage will be either treated on-site or connected to a local communal treatment system, if available" [55]. The responsibility does not end with the hand-over of the waste water to a local contractor. Consequently, even if the contractor dumps the waste water directly into a stream or similar (out of immediate control for UN) the responsibility still remains with the UN to take the appropriate measures preventing this. Contract oversight and supervision are paramount in keeping control over the whole management chain.

3.2.5 New mandates - new tasks

With the growing understanding of the relation between conflict and natural resources (whether abundant or scarce), it has been suggested by e.g. UNEP[56]and Global Witness[57] that natural resource management should form an intrinsic part of peacemaking and peace building strategies. Also, peace operations should be mandated to understand both their position and their own impact better - for instance the monitoring of illicit trade in natural resources (example 6).[58] This, together with the ambition of more integrated/comprehensive approaches, raises interesting questions. Examples are which tasks peace operations will be mandated to do and how the responsibility between civilian, military, and police

[55] UN DPKO/DFS 2009a

[56] UNEP 2009; UNEP 2011

[57] Global Witness 2010

[58] Global Witness 2009

personnel should be shared or distributed. Given the right conditions there are several potential roles for a professional military to fill in a peace operation. The obvious caveat is that whatever additional task the military takes on, it has to be aligned with the overall political aims and goals for the military mission. The limitation of mission creep, which can be expressed as situations in which the military mission expands beyond its original goals, is therefore an obvious risk. In addition, not every troop sending nation has a tradition, doctrine and training for supporting such functions.

Example 6: New mandates for MONUC

An example on new and non-traditional tasks for a peace operation is the role of MONUC *(now MONUSCO)* in DR Congo. MONUC's mandate is among other things to "protect civilians under imminent threat of physical violence"[59]. The UN Security Council's Resolution from 2008[60] extended and strengthened the mandate of MONUC to include an explicit reference for MONUC to use "*its monitoring and inspection capacities to curtail the provision of support to illegal armed groups derived from illicit trade in natural resources*". Until this provision in the mandate was introduced, efforts by MONUC to address the natural resource dimension of the conflict was almost entirely dependent on the dedication of a small number of staff members within MONUC Joint Mission Analysis Cell (JMAC) who monitored and reported natural resource exploitation by armed groups. The strengthened mandate was an improvement but since MONUC was being given this additional mandate without member states providing the troop strength needed to fulfil the task, the outcome was far from clear. MONUSCO faces an extremely difficult task in the DR Congo, being severely overstretched and struggling to cope with many pressing demands. In communication between Global Witness in January and February 2009[61] Alan Doss, the Special Representative of the Secretary-General for the DR Congo at the time stated that MONUC would continue to do its best within the limits of its capacity, but reiterated that the protection of civilians remained MONUC's top priority. In the long term the need to tackle the economic dimension of the conflict should obviously not be seen as a separate task from ensuring protection for the civilian population, since profits derived from the mineral trade are one of the main sources of funding for the armed groups committing atrocities towards the local population. Without member states pledging the necessary assets, the situation described above is not likely to change.

3.2.6 Second or third order effects

Unforeseen (example 7)[62] or damaging actions caused by a peace operation can undermine the perceived legitimacy and credibility of a peace operation and eventually erode its popular support. Side-effects caused by a peace operation may include: social impact (e.g. different cultural norms of mission staff and the host nation), economic impact (e.g. pushing up prices on housing and staple foods) and environmental impact (e.g. lax waste management or over use of water).[63]

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[59] UN 2000

[60] UN 2008b

[61] MONUC 2010

[62] Personal communication with Mr. Didier Dogley, Principal Secretary for Environment at the Botanical Garden, Seychelles

[63] Hull *et al.* 2009; UN DPKO 2008

Example 7: Seychelles - City of Victoria running out of eggs

In a discussion with representatives from the Botanical Garden in Victoria, Seychelles regarding environmental effects from peace operations, the issues of waste and food security were aired. Large hangar ships entering a port introduce an intense, albeit short, time pressure on the waste handling system. Local entrepreneurs are contracted through the ship broker to take care of different waste fractions but in many cases the once separated waste fractions are mixed together and sent to the landfill. In the case of Seychelles, logistical effects associated with food transport and security is experienced when very large hangar ships enter the port. The demand for food soars when a crew of 2000 naval officers enters a city like Victoria with a population of 25,000 people. At one particular occasion the supply of eggs was interrupted in the city as the demand for eggs exceeded the ability to supply them.

3.3 Tools for addressing environmental considerations in peace operations

Many countries and militaries recognise the importance of environmental considerations and management, which can be seen in the development of policies, strategies, regulations, and guidelines concerning environmental issues at the strategic level. In order to ensure that the negative environmental impacts are minimised and that the positive ones are enhanced in joint operations, doctrinal publications can be considered as paramount. Doctrine is essential to know where to start in order to apply environmental consideration principles to uncertain and complex environments.

The following section addresses environmental policies and other strategic high-level document (such as strategic foresights) in selected countries and multinational peace operation organisations. The collected material is presented in appendix 4, and is supplemented with information on the selection criteria against which a particular actor has been selected. A few questions have been developed based on reviews of the actor's position on the environmental agenda; in the first place – are there any existing policies at all? If so, are military operations attended to in general and do they address peace operations specifically? If the country is a NATO member we have investigated whether the relevant STANAGs have been ratified (table 2).

As mentioned in the description of the method (chapter 2), not all existing policies are accessible in open sources. Still a quick search does provide a picture of how the defence actors "market" themselves in this area in the public mind. This can be important for building confidence for the performed activities, since the environmental concern has gained significant support in the public arena.

Different actor's policies widely vary in scope and content; the Swedish environmental policy for the defence sector for instance expresses only an intention to conduct operations and activities in accordance with Swedish national legisla-

tion. However no responsible individuals are designated. This can be compared with for example United Kingdom[64] where responsible actors such as commanders and environmental officers (EOs) are assigned. A common denominator for most however is a caveat that operational imperatives have precedence.

During 2009, UN and NATO constituted 93 % of all peacekeepers deployed.[65] EU, although being a relatively new actor in the area of peace operations, has nevertheless launched several major peace operations the last few years. Many countries have not yet started to address environmental considerations and develop environmental policies for their defence sector, for instance some of the major troop contributors to contemporary peace operations. In order to provide a baseline set of protocols or guidance, the sending entity (EU, UN, or NATO) therefore has a responsibility to give baseline guidance also in environmental matters. It is therefore interesting to look at those three peacekeeping platforms a little more in detail (appendix 4).

It should be noted that what is called a policy in one organisation, can be named strategy in another with significant variations or indeed similarities in scope and content. In figure 2 a schematic illustration of the hierarchy of the different document structures at EU, UN, and NATO are presented.

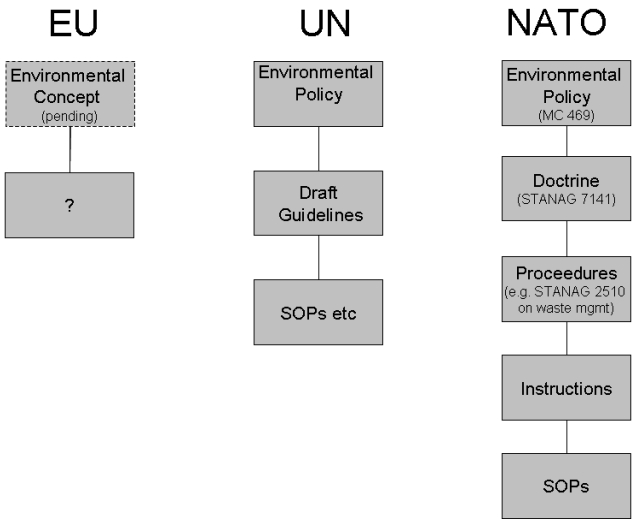

Figure 2. A schematic illustration of nomenclature and hierarchy of documents within the sending entities. Each troop contribution nation may be obliged to comply with the top-most documents (policies and concepts). This picture becomes more intricate when a seconds dimension is added is form of national legislations, both with the contributing countries and with host nations.

[64] Ministry of Defence, United Kingdom 2005

[65] Center on International Cooperation 2010

Table 2. The promulgation and/or ratification status of NATO STANAGs with environmental relevance among the nations studied. STANAG 7141[66], 2510[67], 2545[68], 7102[69] and 2982[70] are promulgated. √ denotes that the STANAG is ratified, (√) ratified with reservations, and NR indicates no response (as to date). Environmental Protection Working Group (EPWG)[71], Petroleum Handling Equipment Working Group (PHEWG) and the Force Health Protection Working Group (FHPWG) are the custodians for respective STANAG.

STANAG/ CUST0DIAN	**BEL**	**CAN**	**DNK**	**DEU**	**GBR**	**NLD**	**NOR**	**USA**
EPWG								
7141	√	(√)	√	√	√	(√)	(√)	NR
2510	√	√	√	√	√	(√)	(√)	NR
2545	√	√	(√)	√	√	NR	√	√
2581*	NR	NR	√	NR	√	(√)	√	NR
2582*	NR	NR	√	NR	√	√	√	NR
2583*	NR	NR	√	NR	√	√	√	NR
PHEWG								
7102	√	√	NR	√	(√)	√	√	√
FHPWG								
2982	√	√	√	√	√	√	√	√
	BEL	**CAN**	**DNK**	**DEU**	**GBR**	**NLD**	**NOR**	**USA**

* STANAG 2581, 2582, 2583 have recently entered the standardisation process and will be promulgated when a majority of NATO member states has ratified them.

3.3.1 Operational Planning

Following the comprehensive approach and effects based thinking, NATO's planning process (GOP), which is adopted by Sweden, has evolved into the Comprehensive Operations Planning Directive (COPD). The COPD covers in detail effects based planning principles, doctrine and processes. It details each step of operations planning at the military strategic and operational levels of command. NATO recognises six domains within an engagement space, which

[66] NATO 2008

[67] NATO 2009a

[68] NATO 2009b

[69] NATO 2005

[70] NATO 2004

[71] EPWG is currently in a merging process with other environmental working/technical NATO groups.

are political, military, economic, social, infrastructure, and information (PMESII). Hence, the environment is not treated in specific, but is an element of most of the above mentioned domains.

At the operational level the most common practice is to incorporate environmental considerations in the planning and execution phase of a peace operation is through the environmental annex to the OPLAN[72] and when available/present in environmental management systems. An example on how this can be organised is demonstrated in example 8.[73]

Example 8: Operationalising environmental considerations in ISAF

In the NATO International Security Assistance Force, ISAF, NATO Environmental Policy (MC 469 applies). The support for environmental considerations is indirectly addressed also in strategic documents at the very highest level. An example is the COIN guidance, issued by COM ISAF in July 2010 where two points in particular have relevance to the environmental area; first, that the NATO forces need to be a good guest and treat the Afghan people and their property with respect and second, to live and stay true to the values we hold dear. In other words, integrating environmental considerations and stewardship should be seen an integral part of the ISAF counterinsurgency operations.

In the more operational and direct sense, the environmental (NATO) policy and doctrine is communicated in the Commander's OPLAN where the environmental component is situated within the engineer annex. The OPLAN is reviewed annually and introduces higher level policy and the context of the host nation (Afghanistan). There are also environmental protection requirements in Standard Operating Procedures (SOPs) and Fragmentary Orders (FRAGOs).

Afghanistan itself actually has quite extensive environmental legislation for a developing country, but the nation does not have the institutional capacity, environmental governance or environmental infrastructure (such as waste management facilities or competent contractors) and the environmental awareness among its people is quite low. Consequently, NATO operations must plan and develop all their environmental infrastructure and environmental protection measures themselves. At the same time, the mission must deliver the operational objectives set. This is where the challenge lie, and consequently, security operations are paramount whereas issues like environmental considerations develop over time as the security conditions allow and the mission matures. Environmental considerations do however catch up in prolonged operations, and capacity building and awareness raising campaigns for e.g. the Afghan National Army has been carried out by ISAF in collaboration with US Forces.

[72] A part of that OPLAN should be an environmental annex or Appendix to an OPLAN (Annex L in the US Army, an appendix to the Engineering Annex in NATO). This annex/appendix provides some assumptions as to environmental threats and risks as well as availability of critical resources necessary to implement and execute the task associated with protection of the environment. The annex/appendix should subsequently be supplemented with Operation Orders (OPORDS) and Fragmentary Orders (FRAGOs) where more detail is needed or as conditions change.

[73] NATO 2003a; ISAF 2010. In February 2010 ISAF and the United States Forces in Afghanistan hosted the first Joint Environmental Shura. The goal of the Shura was to strengthen relationships, share progress and lessons-learned, and create synergy within the environmental community in Afghanistan.

Force commanders are ultimately responsible for the integration of environmental considerations during the planning and conduct of an operation. Force Commanders as well as unit leaders therefore need to be aware of all applicable policy and doctrine, and should define the requirements stated in these documents through a memorandum of intent (The Commander´s Intent), a SOP or similar. References to all relevant policies or guidelines should furthermore be included in the environmental annex to the OPLAN. In order to produce this annex an initial environmental analysis needs to be done typically consisting of four key tasks, namely:

- Identify environmental requirements; such as applicable law and regulations[74] and limitations; e.g. existing infrastructure, geography, and operations tempo that can affect the mission.
- Identify what the environmental considerations are - why they are issues of concern, who should be involved in environmental actions and when these actions are likely to occur during the operation
- Develop and prioritise environmental courses of action (COAs) for the Concept of Operations (CONOPS) and Statement of Requirements (SOR)
- -Identify an environmental resource needed that is to use the environmental protection COAs in the CONOPS and SOR to determine the environmental resources required for the OPLAN.[75]

The OPLAN environmental annex should subsequently be supplemented with Operation Orders (OPORDs) and FRAGOs where more detail is needed or as conditions change. The above mentioned procedures serve to mainstream environmental provisions in the way business is done for other issues in the mission.

Example 9: Seizing the opportunity

In EUFOR Operation ALTHEA, the environmental officer (EO) has developed a comprehensive and useful environmental package. The first OPLAN for ALTHEA had a one-page environmental annex containing geospatial and meteorological information only. This lack of guidance actually gave the EO the chance to develop the whole environmental package (EMS, SOPorganisations, guidelines etc) which is being implemented in the EUFOR/NATO mission throughout the whole theatre. In May 2010 the OPLAN ALTHEA was revised to adapt to the new security and geopolitical scenario in Bosnia & Herzegovina. The EO rewrote the whole "Annex T" to the OPLAN according to NATO standard, with the result of environmental considerations now being highly regarded in the mission.

[74] For instance, environmental legislation of the receiving nation, multilateral environmental agreements and/or troop contributing nation (TCN) environmental requirements

[75] Bosetti et al 2008

3.3.2 Environmental Management Systems (EMS)

A widely practiced method for integrating environmental policy into an organisation is through a formalised EMS[76]. This holds true also for the military and several nations have started to "operationalise" their environmental considerations through EMS for their domestic business. UN[77] as well as NATO[78] also promotes EMS as a useful tool. Since the purpose and nature of a peace operation deployment is often not conducive to implementing a formal EMS, the writing and implementation of an environmental management plan (EMP) serves to promote EMS-like objectives as close to the original as possible.[79] An EMP consists of generic as well as mission specific components. At the very minimum, it should include protocols for waste management, hazardous materials management and spill response, natural resources management, historical and cultural resources management.

Example 10: Environmental Management Systems in the Norwegian Armed Forces and United Nations Mission in Sudan

In 2003 Norway implemented an EMS for the Norwegian Armed Forces domestic activities, based on ISO 14001. For operations, the Norwegian Joint Operational Directive states that the domestic environmental legislation must be adhered to, unless this compromises operational imperatives. Accordingly, in 2008 implementation of an EMS was furthermore made a requirement in the OPLAN for the Norwegian contribution to ISAF. A risk assessment was performed to design EMS, which showed that the following aspects were of particular interest; petroleum, oil and lubricants handling and spill response, cultural heritage and management of hazardous waste. Subsequently environmental objectives, targets and programme were developed and necessary procedures established. Since the implementation audits have been performed, nonconformities are reported on a regular basis and measures for correcting; mitigating and avoiding future (re)occurrence have been undertaken.

Another good example of how an environmental policy has been made effective at the tactical level is the case of the United Nations Mission in Sudan (UNMIS). EO developed and effectively implemented an environmental policy and guidelines for UNMIS, leveraging the DPKO/DFS environmental policy. In addition, he created an EMS that is currently being implemented in the mission and arranged for environmental awareness training efforts to be undertaken, in collaboration with the Swedish Armed Forces and FOI.

3.3.3 Swedish documents

This section gives a brief presentation of Swedish policies and high level documents as well as other relevant documents regarding environmental considerations in peace operations.

[76] Specifications for an EMS have been developed by e.g. the International Organization for Standardization (ISO) 14001 standard that defines an EMS as part of a comprehensive management system.

[77] UN DPKO 2009a

[78] NATO 2008

[79] Bosetti et al 2008

The Swedish national strategy for participation in international peace-support and security-building operations[80] presents an ambition to bring civilian and military activities in the operations more closely together. The operations aim at maintaining international peace and security and consequently also at facilitating a fair and sustainable global development. This is also the aim for the Swedish policy for global development, which is also a key basis for Swedish participation in operations in developing countries.[81]

The most recent environmental policy for the Swedish Armed Forces was published in 2011[82], and is to large parts common for the whole defence sector. National legislation[83] is the basis for the environmental policy, and consequently it can only be used as guidance for peace operations. The environmental policy states (in Swedish) that the "defence sector works towards a sustainable development where environmental considerations are integrated in all activities, domestic as well as international". The Swedish Armed Forces shall strive to minimise the ecological footprint in the solving of the main tasks (i.e. those of conflict prevention and management). It does not state explicit goals or responsibilities, nor gives guidance on how to address environmental issues in peace operations.

The Swedish Armed Forces Development Plan (FMUP) for 2011-2020 states that standardisation agreements developed by EU and NATO should be implemented to the necessary extent, to facilitate interoperability even though Sweden is not a member of NATO.

In cooperation between Sweden, Finland and United States an environmental guidebook for military operations was developed in 2007-2008[84], leveraging existing bilateral defence environmental agreements. The guidebook contains practical tools and checklists. It is intended to be used by planners, commanders and environmental officers to incorporate environmental considerations throughout the whole life cycle of an operation. During 2010, the guidebook was incorporated as an official document in the Swedish Armed Forces and can now be referred to in the OPLAN.[85] Furthermore, in 2009 an advisory committee on Camp Protection was engaged to define and distribute roles and responsibilities between the Swedish Armed Forces and supporting national authorities throughout the whole life cycle of an operation. The committee identified in its final

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[80] Swedish Ministry for Foreign Affairs 2007

[81] Swedish Government 2002

[82] Swedish Armed Forces 2011a

[83] Swedish Environmental Code 2000

[84] Bosetti *et al.* 2008. Although the guidebook is designed for use by any sending nation, it consists of recommendations only and does not necessarily reflect official policy or doctrine. Therefore, the guidebook has been incorporated in official Swedish doctrine.

[85] The reference number of the document within the Swedish Armed Forces is M7739-350027

report[86] several critical moments and decision points in the different phases of an operation such as: long term planning, initial planning, reconnaissance, deployment, and liquidation,[87] where environmental considerations are required.

In the Swedish Armed Forces' long term planning[88], it is recognised that issues such as territorial disputes and competition for scarce resources can be intertwined with the negative effects of the global environmental and climate change.

In recent years the Swedish Armed Forces has included an Environmental Vulnerability Assessment (EVA) in their pre-deployment Medical Intelligence Reports, in recognition of the need to address environmental vulnerabilities in the mission area. Environmental security becomes an obvious element in the assessment since it puts the environmental issues into the context of the conflict. The role of for example natural resources is recognised in order to gain an understanding of the situation and thereby a possibility to avoid unintended negative consequences. EVA also seeks to include gender issues and socioeconomic effects of e.g. establishing and operating a base camp.[89] In addition it identifies legal framework and institutional capacity of the host nation. EVA has been performed for a number of operations, such as those seen in the Gulf of Aden, Chad, and Afghanistan.[90]

[86] Swedish Armed Forces. 2009a.

[87] The Camp Protection report uses somewhat different terms for the different phases in an operation compared to the environmental guidebook.

[88] Swedish Armed Forces 2009b

[89] The EVA tool for the Swedish Armed Forces will be further developed within the framework of the research project "Environmental Risks in Peace Operations" (2010-2012), in order to be suitable for pre-deployment assessments.

[90] Swedish Armed Forces 2008, 2010 and 2011b

4 Environment in peace operations – Swedish experiences

Experiences from participation in peace operations suggest that much work remain before environmental aspects are fully incorporated in planning and execution of an operation.
Although there are several good examples where environmental issues have been handled well, there is too much dependence of personal commitment. The operations are – at least initially – characterised by *ad hoc* solutions, for instance when it comes to material/facilities, not adapted to the local environment or the infrastructure of the host nation. Many difficulties would be possible to reduce through careful planning and training, but in general, environmental training and awareness is insufficient, also at the leadership level.
The present organisation, with EHO in the logistics branch, makes it difficult to overview all environmental aspects of the operation and hence to propose proper actions. The primary task for EHO is preventive medicine, while environmental issues is a secondary task, which is mainly characterised by day-to- day issues such as spill prevention, coordination of management and collection of waste and sewage. Advice from EHO is seldom sought in more complex environmental-security related issues.
Furthermore, control over all environmental aspects is difficult, one example being the control of the whole waste management chain in order to ensure that contractors do not dispose of the waste in any improper way.

In this chapter we describe some of the Swedish experiences made from working with environmental considerations in peace operations. There is of course a vast amount of different experiences, many which are striking examples illustrating the challenges and difficulties in integrating environmental considerations to the full extent in an operation. Bearing that in mind, we have chosen some examples that indicate that environmental considerations are actually beginning to find their way into the planning and execution of Swedish peace operations. This serves as a foundation not only to discuss what does not work today, but also what possible solutions there may be. Every operation and local environment is of course unique, but what has turned out to work well in one situation may very well be applicable in another.

Over the last decade much of the Swedish Armed Forces' experience from peace operations has been transferred to FOI through research projects and within the framework of the Swedish Armed Forces' medical intelligence.[91] Valuable

[91] FOI supports the Swedish Armed Forces medical intelligence by performing health threat assessments for Swedish Peace operations. Since 2008, special focus has been on environmental vulnerabilities including any conflict - environment relation in the area of operation.

knowledge has been collected through channels like: weekly situations reports, discussions about environmental issues with commanders and key personnel,[92] pre-deployment or in-theatre training efforts, visits to theatres (e.g. sampling campaigns), and lessons learned seminars, to mention a few.[93, 94]

The Swedish Armed Forces was one of the first governmental agencies to work with environmental management systems in the beginning of the 1990-ies. However, different units had their own systems, implemented to varying degrees and there was no central management. In fact the headquarters, i.e. the highest level of command do not yet have an EMS. A key feature of an effective EMS is the dedication and support from the central level.[95] The 2005 letter of regulation for the Swedish Armed Forces from the government called for environmental considerations to be taken into account in Swedish peace operations. This requirement was further specified in the letter of 2006, which required a system for environmental protection in Swedish peace operations to be introduced by the end of 2008. However, this system is still pending. The Swedish Armed Forces is currently exempted from the national regulation on environmental management in governmental agencies,[96] due to difficulties in including peace operations. Work is however under way to implement a central EMS, with some exceptions regarding international operations.[97]

In 2007 an environmental guidebook for military operations was developed in cooperation between Sweden, Finland and the United States.[98] Four years later the situation has not improved satisfactorily, at least not in a systematic way. This is evident for instance in discussions with several of the EHOs[99] that have been deployed, as well as with personnel in supporting positions in Sweden.

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92 For instance EHOs, fire and rescue personnel and medical personnel such as Senior Medical Officer (SMO).

93 Wingfors and Höjer 2008; Edlund 2007; Edlund 2010; Areikat *et al* 2006; Liljedahl *et al*. 2001 a, Edlund 2003; Edlund and Liljedahl 2002; Bhatta *et al*. 2008; Liljedahl *et al.* 2008; Waleij *et al.* 2005b; Waleij *et al*. 2004; Edlund *et al*. 2002; Liljedahl *et al.* 2001 b; Edlund *et al*. 2004; Morton *et al.* 2009; Waleij 2010

94 Interviews with Environmental Health Officers in Swedish contingencies in KFOR, Kosovo, KS01-KS06, unpublished material in possession of the authors.

95 See for example the Swedish Environmental Protection Agency, URL <http://www.naturvardsverket.se/sv/Start/Lagar-och-styrning/Miljoledning-for-myndigheter/Om-miljoledningsarbetet-i-statliga-myndigheter/Miljoledningsarbetet-och-uppdraget/> (in Swedish)

96 Swedish Government 2009

97 Personal communication with the Swedish Armed Forces, Headquarters

98 Bosetti *et al.* 2008

99 Sweden deploys civilian environmental health officers (EHOs) that deal with both preventive medicine and environmental protection, whereas many others nations have civilian or military engineers for environmental issues and preventive medicine personnel for force health protection issues. For yet some other nations environmental protection is an additional task for a CBRN officer.

There are for instance still too many *ad hoc* solutions. The EHO is often left with having to deal with a poorly planned infrastructure for environmental considerations, which could result in unnecessary oil spills or improper waste water runoff. In addition, the perception is often that there is a generally low awareness of the potential direct and indirect negative impacts that may arise from poor environmental stewardship. The guidebook has recently become an official document of the Swedish Armed Forces.[100] However, although there are examples of its use in operations, it has yet to be fully and systematically implemented and training material to facilitate its implementation is therefore underway. It should also be noted that the guidebook is not regulatory, and hence there is no legal obligation to comply with the suggestions being made in it. Still, the existence of such an official document enhances opportunities of including it into the environmental annex to the OPLAN. Furthermore, it is very useful as a toolbox and a starting point for good environmental stewardship.

At an organisational level, EHO is often placed in the logistics branch in an operation. This may be the proper position when it comes to handling technical, infrastructural issues such as waste and water management, but will not provide the optimal channels for addressing more complex questions regarding for example environmental-conflict relationships on a strategic level. This can be compared to the Gender Advisor, which is often in the Commander's advisor group, and therefore has a better opportunity of participating in the planning of operations in the theatre and communicating appropriate actions.

In general and on the day-to-day business in a base camp, the main task for a Swedish EHO is preventive medicine issues such as food- and water hygiene. Environmental protection is only a secondary task. The majority of the environmental issues to be dealt with are associated with fuel handling, waste and waste water management, and there are supervisions performed on a regular basis by military authorities.[101] There are often routines and infrastructure to secure a proper handling of such issues inside a larger base camp, at least when the initial phases of a deployment are over. For satellite camps or team sites, the situation may be different. The type and duration of the operation as well as the size of the compound will influence the infrastructure solutions.

During a long term operation, or when a mission matures, the base camp can be provided with more permanent and robust infrastructural facilities, such as waste water treatment plants (e.g. at Camp Victoria, the Swedish contingency in

[100] M7739-350027

[101] The Surgeon General makes regular inspections on a yearly basis to all Swedish contingencies. The inspection is performed in accordance to The Swedish Armed Forces Regulations and Instructions (2007:1266), The Infectious Disease Regulation (2004:255), The Food Regulation (2006:813) and the Swedish Environmental Code (1998:900). The inspection is intended to ensure that regulations and laws are complied with but also to provide guidance and information in order to enhance observance.

Kosovo). Ideally these options would be planned for and installed immediately but initially these solutions may not be realistic.[102] Hence, there is a larger dependence on temporary and/or more field expedient solutions and local contractors providing services.

It is a demanding task to firstly ensure that the contracts for services like pest control or solid and liquid waste management include environmental provisions, and secondly to supervise that these contracts in fact are followed. This holds especially true when it comes to for instance waste water or sewage which is often dumped or released in a way that is not in compliance with the laws of the sending nations or good environmental stewardship. In the case of a UN field mission, UN is responsible for providing wastewater treatment.[103] The UN environmental policy, effective since June 2009, states that the chief of mission support is responsible for waste water not being discharged into rivers or streams without prior treatment.[104] This is however not always the case, see e.g. the Haiti case in example 5. The waste water treatment offered by UN for the mission in Liberia in 2004 did not meet Swedish environmental standards. Sweden hence deployed a package WWTP (waste water treatment plant) system at Sweden's own expense.[105] However, the sewage was still disposed of through a UN contractor and dumped in the outskirts of Monrovia, adjacent to private property used for growing vegetables. It is important to notice that this situation is not unique for UN-led missions; similar situations occur also in both EU- and NATO-led missions.

Another recent example is the Swedish contribution to the EU NAVFOR operation in the Gulf of Aden in 2010. The officer responsible for environmental issues at HMS Carlskrona developed an Environmental Action Plan prior to deployment based on the Swedish Armed Forces Environmental Guidebook.[106] His experience was that there were no difficulties addressing environmental considerations in the every day life at the vessel, as they were included as a natural element in all activities.[107] This is one of many cases where personal commitment and individual initiatives in combination with environmental training and

[102] The integration of solutions, which offer upgraded environmental performance and resource saving capabilities can actually allow for immediate operational benefits. Such benefits will e.g. include force multiplying as well as improved security and flexibility by reducing the logistical footprint associated with a dependence on e.g. fuel and water transports. It will also reduce risks for expensive environmental cleanup.

[103] In UN peacekeeping operations some equipment are UN owned (UNOE) and provided to the troop contributing nations and international staff whereas other equipment are contingency owned (COE)

[104] UN DPKO 2009a

[105] Improvements within the UN system include a new system contract for WWTPs

[106] Bosetti *et al.* 2008

[107] Personal communication, Environmental officer at HMS Carlskrona, ME02

knowledge[108]on EHO level have resulted in well-turned-out ways of addressing environmental considerations on tactical level. The control of what happens outside a camp; in this case a navy vessel, is however always to some extent limited. During this period, food waste and hazardous waste from EUNAVFOR was dumped at a local landfill outside Mombasa by one or more of the contractors. Local population was scavenging the landfill and some people allegedly got sick resulting in a riot and anger towards the mission.

The decision made by the Swedish Armed Forces not to bring water closets to the operations in Chad is an example showing that environmental issues are indeed beginning to influence the operational planning. The pre-deployment Environmental Vulnerability Assessment[109], confirmed by the reconnaissance prior to deployment had highlighted that the local water resources were scarce. Decisions regarding resource conserving equipment (i.e. a latrine system with the intention to compost the solid fractions) were taken accordingly. However, on site there was no possibility to operate this equipment correctly. Although the latrine residues were separated from the rest of the waste stream, the contractor who collected the waste disposed all of it at the same site, to which the local population had free access and were scavenging for food etc.

When Sweden deployed to Kindu (DR Congo) in 2003, UN directed dumpsite for the waste from the Multinational Camp was located close to the living quarters, a Level 2 hospital and the water plant, where water was purified in open tanks. The handling of waste in open flat containers and the proximity to the dumpsite meant that the hospital area, the water purification area, as well as living quarters and food premises were infested with rodents, insects and scavenging birds. The smell and/or smoke from the dumpsite could be dense over the camp area depending on weather conditions. In addition, the dumpsite had no protecting liner or coverage. The following assessments were made:

- The handling of waste should be based upon environmental, hygienic, ethical and economical standards.
- The handling of waste should not increase health hazards for UN personnel or population of DR Congo.
- The existence of UN troops in DR Congo should not contribute to environmental pollution of the country.

This led the Swedish contingent to, with much valued input from the EHO, request to MONUC that measures be taken as soon as possible, both to improve the waste management situation, and to protect water bodies, ground water and soil. Suggestions were also made that leachate water should be collected and that the landfill should be fenced. MONUC acted on the request by constructing a

[108] In this case also a knowledge of the pure existence of the guidebook.

[109] Swedish Armed Forces 2008

new landfill located further away. However, this led to collection of waste on a less regular basis, and thus some of the previous problems with pest scavenging the waste prevailed, now even closer to the living quarters of the UN forces.

A final example of how environmental considerations are starting to be implemented is the liquidation process of Camp Victoria in Kosovo. The Swedish Armed Forces initiated the close down process in early 2010 leveraging the environmental guidebook and other processes within the Swedish Armed Forces taking environmental considerations into larger account. The Swedish troops deployed to Kosovo in 1999 and at the time procedures for e.g. EBS or environmental health site assessment (EHSA) were nonexistent in the Swedish Armed Forces. Some sampling was performed by the contractor building the site but in retrospective the deficiency regarding the pre-deployment surveys is evident. There are for instance insufficient data regarding background levels of pollution and documentation regarding environmental issues has not been structured and collected in a systematic way, which has made the process at finding the necessary information quite time consuming.

Even though environmental considerations are only one of many issues to take into account in an operation, there is never a good excuse to disregard of planning for proper environmental considerations, to the extent possible. The challenge is that the awareness of the benefits from doing so, in terms of e.g. potential cost savings and enhanced force health protection is quite low. Awareness regarding environmental consequences from peace operations on a general level is also low. It is a often expressed view among unversed that compared to the environmental situation “in general” in an operation area, the contribution in terms of the environmental impact from the operations itself is minimal and hence can be disregarded. This is an additional challenge an EHO has to deal with and in combination with being either a civilian and/or being a low rank officer, environmental issues often takes the back seat.

5 Environment in peace operations – previous studies

The studies reviewed have concluded that environmental issues, if not properly addressed in the planning and execution phase of an operation, can be non-conducive to soldier health, can increase the overall costs, make it more difficult to sustain the mission, and even achieve overall mission success. Furthermore, there is a gap between environmental policy and practice; environmental considerations are not well incorporated into operational planning or execution. The policies need to be transformed into an uncomplicated and easily comprehensible environmental guidance, adapted to the requirements of an operational setting and made available in the field. In addition, nations deployed in peace operations are not obligated to comply with environmental requirements to the same extent as at their domestic installations. Further challenges identified were lack of resources, insufficient training and awareness, a generally low interest from military leadership and unsatisfactory knowledge transfer of lessons observed/identified into e.g. strategic planning.

In addition to more generic future outlook studies several nations have drafted specific environmental long term future outlook studies. Since environmental developments and trends are among the factors that have been identified by EU, UN and NATO to influence the possible shape of the future security situation more nations are likely to follow.

Tools such as instability indexes and state fragility indexes do not specifically address environmental changes. New or alternative measurement techniques are needed to track environmental trends over time, especially those that report on the conditions of ecosystems is needed.

This chapter summarises some studies that are relevant to compare with the experiences drawn from Swedish participation in peace operations.

5.1 Environmental Considerations for Contingency Operations from Planning Through Post-Conflict

As a consequence of an identified need for increased emphasis of environmental considerations in military operations, RAND Corporation performed a study in 2008.[110] The aim of the study was to evaluate the United States Army's environ-

[110] Mosher *et al.* 2008

mental performance in its overseas contingency operations, identify existing problems and gaps in policy, doctrine, and propose possible solutions.

The study drew information from a broad range of sources including US DoD, Joint Staff, and Army regulatory and doctrinal publications, domestic and international statutes pertaining to the environment as well as open source material on environmental best practices. In addition, a wide range of people with environmental responsibilities or experience were interviewed. Lastly, a database of environmental operational experience was created, where military actions had either a positive or a negative effect on mission objectives.

The report concluded that environmental considerations, such as water and waste management, if not properly addressed in the planning and execution phase of an operation, can increase the overall costs and make it more difficult for the Army to sustain the mission and even achieve overall mission success. Yet, the study concluded that environmental considerations were not well incorporated into any phase of an operation. The major findings as related to contingency operations were that:

- Environmental issues can significantly impact operations as well have far-reaching impacts across operations, Army organisations, and the world.
- Environmental considerations can be particularly important in the post-conflict phase and differ significantly from domestic operations.
- Inadequate environmental practices can increase costs and liabilities, create diplomatic problems, and can be non-conducive to soldier health.
- The Army could improve its understanding of environmental considerations incorporate them more effectively into planning and execution of operations.
- No comprehensive approach to environmental considerations exists in contingencies, let alone in the post-conflict phase.

Consequently, recommendations were made to address these perceived deficiencies, including that the Army needs to improve its policy and guidance for environmental considerations in contingency operations, acknowledging the cultural change required to do so. The study specifically emphasised the planning phase, including pre-deployment environmental training.

The integrated approach to planning and operations that is put forward in the US Army Strategy for the Environment[111] was mentioned as a role model for approaching environmental considerations in contingency operations. The Army

[111] United States Army 2004

strategy defines mission sustainment by recognising the interrelation of the mission, environment, and the community as a "triple bottom line".[112]

5.2 Sustainable, Full Spectrum Contingency Operations Gap Assessment

In 2008 the Engineer Research and Development Center of the US Army Corps of Engineers (USACE ERDC) performed a study, "Sustainable, Full Spectrum Contingency Operations Gap Assessment"[113], assessing the sustainability of US base camps in contingency operations, identifying gaps and determining if these are currently being adequately addressed. Included in the gap assessment were issues concerning general aspects of the planning, operation and management process of base camps including contracting issues regarding design and construction of infrastructure and facilities as well as issues specifically concerning water, waste, power and energy management. Recommendations on solutions to identified gaps were based on elements of the DOTMLPF (Doctrine, Organization, Training, Materiel, Leadership, Education, Personnel, and Facilities).[114] The focus of the report was on base camp infrastructure and the main body of the document details reviews of suitable technological options. Significantly soft issues i.e. those concerning procedure, training or organisational requirements were also included.

It was identified that although policy and procedures often are in place concerning for example waste management - and furthermore, that soldiers are aware of how to properly manage these issues at their home base - these practices are frequently being "left at the home station" and not adopted in the field. Current practice regarding the development of environmental guidance was said to be to offer material not applicable in a deployed setting or not comprehensive enough to be considered very useful. It was also identified that contingency operations are not obligated to comply with environmental requirements to the same extent as installations in the US and hence environmental considerations are not regularly enforced.

The study mentioned cases where soldiers disposed of hazardous waste inappropriately with the supposed reason being that "no one is observing these practices", indicating that there is indeed a lack of environmental regulation enforcement capability in the field. Often lack of time was also indicated as a reason for improper environmental management. It was mentioned for example of cases

[112] The triple bottom line of sustainability: mission, environment, and community is part of a US Army systems thinking acknowledging the interrelation between those issues as well as the benefits to address them in an integrated manner.

[113] Curtin *et al.* 2008

[114] The DOTMLPF concept is widely used by the US DOD for performing capability gap assessments.

where support staff in an effort to free time for more prioritised operational tasks sometimes ignored environmental protocol, which later developed into both environmental as well as logistical problem. Lack of training on base camp management issues was also found to be common, where soldiers do not receive sufficient training in the required skills needed to fulfil their tasks. Instead much of the skills had to be gained from *on the job training*, however there is often minimal interaction between the personnel during rotation of troops and hence a lot of mistakes re-occur. The problems were indicated as being more frequent in smaller forward operating bases and satellite camps where resources set aside for environmental management are most limited. This is affecting operational efficiency by wasting resources on inefficient processes and costly logistical support chains, which in turn causes security, safety, and health risks for the deployed forces. Low motivation or experience of employing alternative solutions for presenting environmental management benefit, as well as time constraints during planning, were also mentioned as a potential reasons why planners and decision makers avoid options that could potentially offer operational benefits and instead go for "safe options". There was hence a stated need for increased emphasis on awareness building through doctrinal changes as well as training.

5.3 Critical factors required to integrate environmental policies

In 2004, a Canadian study, "Critical Factors Required to Integrate Environmental Policy into the Overall Management System of Operational Military Bases",[115] was conducted with a twofold objective: firstly to determine whether an EMS or environmental protection program facilitates integration of environmental protection into Canadian military operations, and secondly, to identify the critical factors that either prevented or resulted in an integration of environmental practices in the operations. According to a study performed at the University of North Carolina[116] an EMS offers the potential to significantly increase the efficiency and effectiveness of environmental programs in business and government organisations. The success of an EMS in achieving these benefits depends, apart from its content, on management and employee participation, the resources and internal capacity at the facility and external pressures. The study investigated whether the same holds true in a military organisation.

The study was conducted in two phases, of which the first consisted of a literature review and a questionnaire survey among environmental officers at military bases throughout Canada. In the second phase the findings from the first phase survey were discussed with senior military leaders to examine how environmental protection might be improved within the Canadian Defence.

[115] Allan 2004

[116] Andrews 2003

The two most prominent problems with successfully implementing an EMS or environmental protection program were identified to be lack of resources and lack of training and understanding regarding new responsibilities at the base level. The source for these problems proved to be linked to an identified disconnection between environmental policy at a national strategic level and the implementation of this policy at the operational level. A major factor contributing to this was identified to be a lack of line accountability as the policy was moved downwards in the implementation chain due to a shortage of collaborative structures and fundamentally different approaches to risk management between strategic and operational level. The differences in approaches were described to have resulted in policy being developed for risk avoidance rather than risk management. This was making it impractical to incorporate in a conventional risk management structure of a military base, where resource limitations often do not allow for an avoidance approach. Providing additional resources to support the introduction of policy and new EMS, which indeed could put additional pressure on the operational budget also proved to often be left wanting.

To resolve the issue of policy not fitting the operational setting, it was highlighted that senior military leadership needs to have an ownership interest in environmental protection and that policy needs to be better adapted to requirements of an operational setting. One way of achieving this was, according to senior officers within the Canadian Armed Forces, to allow military staff to participate in developing policies that are workable within the organisation. The authority assigning responsibility to implement new environmental policy must also ensure that sufficient resources are allocated in the implementation process. In order for policy and new requirements to gain legitimacy at the operational level it must also be introduced through, and supported by, the operational chain of command. It was therefore stated to be critical that the commander leads by example by mandating the importance of environmental protection in his/her work and in his/her communications with base personnel. This will influence the level of environmental awareness throughout the base making environmental protection more relevant and part of the working culture. If military personnel are also provided with basic training to increase their understanding of the potential environmental impacts from their jobs and in simple mitigations measures, environmental protection can be made part of everyone’s job. At this point environmental issues were described to have the possibility to compete with operational requirements which would allow for the appropriate resources to be allocated to environmental protection in the overall military risk management strategy.

For the role of the environmental officer to be effective, it was described that he or she needs to be a valued advisor to the commander since the commanders require specialist advice before making decisions in increasingly complex operational environments. Hence, the role of the environmental officer in fact is not so much to protect the environment, but to protect the commander. This will be

achieved by interpreting policy and directions from the strategic level with requirements of the operational environment.

5.4 Water and waste management in base camps

In 2009 two parallel studies[117] were performed by FOI. These were aimed at analysing current practices and procedures concerning environmental management in relation to the ability to achieve satisfactory levels of environmental considerations in peace operation base camps. The focus areas of the studies were on water supply and waste management respectively, but much of the findings for example those concerning issues involving policy in relation to the implementation of sound environmental practices at the tactical level, were very comparable between the two studies and as such believed to be relevant and applicable in a broader spectrum. The studies were based on reviews of available national as well as multinational troop sending organisation environmental policies and guidance material for each research topic (water and waste). Also surveys and interviews involving a total of 30 area specific experts with experience from implementing existing policy and doctrine were performed. The results showed that how policy and doctrine actually apply is uncertain and difficult to assess. The availability of practical guidance dealing with the issues of how to actually implement the requirements stated in the standards and policies was also expressed as a limitation by the study participants. The knowledge and awareness of the environmental issues included in the documents were also expressed as a limitation, especially in the higher echelons i.e. “decision makers”, with the result that many decisions were made where environmental considerations were overlooked or disregarded. In addition a gap between policy developers, strategic planners and the personnel working in the field was identified. Knowledge transfer was also identified as being a major limitation, resulting in lessons learned in the field not being captured in future strategic planning. The issue was expressed as a problem due to the perception that a lot of resources were unnecessarily wasted by environmental or related functions in the field “reinventing the wheel” when solving reoccurring problems.

When reasons and consequent solutions to these problems were discussed several issues were raised. One of these was expressed as a need for increased environmental awareness raising and training of field personnel. A way of compensating for the general lack of awareness was to issue a simple and easy to understand environmental guidance and make it available in the field. The opinion of several of the study participants was also that current guidance material and policy generally describes what should be done but that very little is said about how, or even why, to do it rendering many (especially field based personnel responsible

[117] Martinsson 2010a; Martinsson 2010b

for the actual implementation of a system) to question its relevance. Another issue was that many do not know what environmental management guidance material is available nor pay any attention to the issued material since direct application is either not required or that requirements are not followed up.

5.5 Environmental Future Outlook studies

Within the NATO Allied Command Transformation (ACT), an extensive Multiple Futures Project[118] has been carried out in order to strengthen the understanding of the future threats and challenges that could pose risk to the interests, values and populations of the Alliance. Future outlook studies are based on an analysis of political, social, economic, technological, environmental and demographic changes and developments. Environmental developments and trends are among the factors that influence the possible shape of the future security situation. In the course of the ACT project, information has been collected and analysed, but the environmental angle has not been specifically addressed. In the final Multiple Futures Project report, environmental factors are mentioned only a few times but intensifying the depth of the environmental study was considered to be helpful in supporting the conducting of future work. This fact was acknowledged by Germany and the Netherlands, who, together with ACT, sequentially arranged a NATO Science for Peace and Security (SPS) Programme workshop on "Environmental Future Outlooks and their Military Implications" in 2009.[119] The aim with the workshop was to analyse and strengthen the environmental basis for strategic planning in nations as well as within NATO.

Thirty participants, representing ten NATO member states[120], two Partner states[121], four NATO bodies[122], and EU attended the conference. About half of the conference participants served as environmental experts within their Ministry of Defence. In advance of the workshop, a questionnaire was sent to all participants on a number of issues concerning Environmental Future Outlook studies, expertise, priority topics and international cooperation. Out of the 17 countries and organisations represented, 13 (76 %) had replied to the survey prior to the workshop.

Of the countries/organisations present at the workshop 77 %[123] had a general long term future outlook study whereas 38 %[124] also had a specific *environ-*

[118] NATO 2009b

[119] NATO/SPS 2010

[120] Albania, Belgium, Canada, Germany, Estonia, Finland, the Netherlands, Norway, Turkey and USA

[121] The Former Yugoslavic Republic of Macedonia and Ukraine

[122] Staff of the Secretary General ACT, SPS, NATO School

[123] Belgium, Canada, Germany, Estonia, Lithuania, Finland, the Netherlands, Norway, USA ACT

mental long term future outlook study, ranging from 4-30 years time span (average 16 years). When asked for the top three environmental issues for the nations or organisations, one third of the participants mentioned climate change and its consequences, followed by energy, waste and water pollution. Seventy percent of the MoD's present at the workshop had environmental expertise in their organisation and almost everybody uses external advice when necessary. Seventy percent of the countries or organisations cooperated with other MoD's on environmental issues.

During the conference briefings of the existing environmental long term future outlook, studies were performed as well as discussions on recent developments regarding environmental future outlook issues in general. The most important future issues affecting the trans-Atlantic community were determined by the participants to be: disruption of flows of vital resources, disruption of access to critical resources, uncontrolled migration from disasters, manmade disasters, and consequence management from catastrophic environmental change, climatic disasters, and rise in sea level.

By grouping these issues it was agreed that a follow-up of the workshop would further consist of access and sustainable use of energy and resources, uncontrolled migration from disasters, disaster relief operations and sea level rise.

5.6 Environmental Factors in Forecasting State Fragility and Regional Instability

In 2010 the US Army Environmental Policy Institute (USAEPI) performed a review of tools that currently are used to predict regional instability eventually leading to so called "failed states".[125] The findings were published in the report "Environmental Factors in Forecasting State Fragility and Regional Instability".

The study was performed due to the current shift in the direction of the United States global military involvement and interventions that requires better tools to foresee emerging conflicts.[126] The focus in the study is to a larger extent than

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[124] Canada, Germany, Finland, the Netherlands and USA

[125] US AEPI 2010

[126] For instance, presidential and DoD directives (The White House 2005; Department of Defence 2005) and recent Army Field Manuals (Department of the Army 2008a and 2008b) reflect a growing recognition and mandate to understand factors that influence state fragility and instability

previously set on the early stages in the chain of events that leads to instability and conflict. An increased understanding for the factors that can enhance or diminish the stability of fragile states can assist in the planning of future military interventions and further facilitate a "Whole of Government approach".

The study researched existing quantitative analysis approaches to examine relationships between environmental factors, fragility, and instability and also screened existing early warning architectures to enhance fragility assessment approaches.

The report addresses to two main questions:

1) what indexes exist for measuring instability and fragility, and

2) can environmental factors or alternative analytical architectures help improve these indexes?

To answer these questions the AEPI and partners performed a review and a statistical analysis of different indexes. They also performed interviews with subject matter experts and other relevant stakeholders.

The study found that a large number of instability indexes exist that all generally works well to identify high-risk regions for conflicts in near time. However, there are deficiencies when it comes to predicting more long term conflicts which makes it more difficult to analyse medium-risk regions. Also, the simplicity of the instability models does not provide sufficient breadth of actionable forewarning.

State fragility is understood as a precursor to state instability, conflict and collapse[127] but the report identified a conceptual discourse on fragility. While acknowledging this reality, its ability to integrate key concepts is likewise its strength. Unlike the *instability* indexes, the longer timescale and disaggregated nature of the sector subcomponents of *fragility* indexes were identified more likely to be more compatible to the inclusion of environmental factors. The concept is still maturing, but fragility indexes seem to offer a policy-useful and informative partner to instability approaches when used in a paired manner.

The study found that existing instability and fragility approaches generally do not address environmental factors as a specific sector. The statistical analysis findings however suggested that environmental factors did slightly improve the base

[127] OECD definition of a Fragile State: "States are fragile when state structures lack political will and/or capacity to provide the basic functions needed for poverty reduction, development, and to safeguard the security and human rights of their populations". Principles for Good International Engagement in Fragile States and Situations 2007, as reported by Mata and Ziaja, in User's Guide on Measuring Fragility, 2009.

model's ability to predict fragility overall, though only those that measure health-related aspects of the environment had a measurable effect. The result hence indicated that the indexes probably would benefit from incorporating environmental factors but the research also found significant limitations in the availability and quality of nation-state environmental data to include. Because of these data limitations, statistical models cannot capture the impacts of environmental stresses to an acceptable degree of accuracy. New or alternative measurement techniques are needed to track environmental trends over time, especially those that report on the conditions of ecosystems.

The study further suggested that both instability and fragility indexes could increase their accuracy by using a combined, qualitative and quantitative approach with transparent methodologies and data sets. The report therefore recommended that a hybrid approach incorporating qualitative and quantitative data should be used when using fragility as an early warning tool. It was also recommended that:

- Geospatial methods should be used in state fragility analysis to incorporate environmental conditions and address data challenges that do not reflect nation-state borders.
- Additional research to more fully assess which effect environmental factors may have on fragility should be conducted.
- The development of transparent fragility indexes that utilise open source data should be promoted.
- Stakeholders within the US Army should be engaged to better document, share, and leverage good practices.

6 Experiences and opinions of area experts

Knowledgeable individuals from selected troop contributing nations and multi-national troop sending organisations were asked to participate in an e-mail based survey/semi-structured interview addressing environmental policies and other strategic/high level documents as well as current status/potential success factors regarding their implementation.

Q1: How are environmental policies motivated in the planning and execution of complex peace operations?

Environmental policies are primarily motivated – if at all - by "non-environmental" drivers in the planning and execution of peace operations, namely legal compliance, force health protection, financial/logistical, good will/ethical drivers, security and "common sense".

Q2: What difficulties and problems do you see as primary for the ability to integrate environmental considerations into strategic and operational planning?

The major challenges for the ability to integrate environmental considerations into strategic and operational planning were stated to be: current mind set and/or lack of awareness among planners, resource constraints, security issues, and/or operational constraints, lacking environmental information in conflict analysis, limitations within environmental guidance, no mandate given by member states, and/or lack of common standards. As of today, the environmental policies are not yet fully integrated with the other policies used for planning and execution and environmental considerations are often seen upon as an additional constraint.

Q3: Could increased emphasis on the importance of environmental issues for mission success facilitate the integration of environmental considerations into strategic and operational planning?

An increased emphasis on the importance of environmental issues for mission success would indeed facilitate the integration of environmental considerations into strategic and operational planning, although some argued that awareness exists already but not the resources to implement them. Nevertheless, convincing evidence that link environmental issues with operational success and cost efficiency is warranted.

Q4: What should an organisation ideally look like in order to make sure environmental considerations get appropriately addressed (as opposed to how it may look today)?

The ideal organisation would at the very least include an environmental policy that is regularly reviewed, an EMS in place and training and awareness program adjusted to match various organisational levels. In addition, environmental expertise should be attached at the management level and operational areas have an environmental planning officer. In theatre there should be an environmental unit that deals with operational environmental issues.

The following section will present the results from the semi-structured interviews of the selected experts. The section is structured in accordance with the questions asked.

6.1 Interview participants

In consequence of the relatively limited number of people that have expertise in the area as well as the difficulties of accessing these individuals, the main sampling method used was purposive and convenience sampling, meaning that the selection of informants was based on using the previously established network developed by FOI. A total number of 25 persons from ten nations and three troop sending organisations (EU, UN, and NATO) were originally asked to participate in the study. The response rate to these initial questions was 19 individuals, which correlated to 76 % (figures 3 and 4). It should be cautioned that the sampling methods used are all non-probability sampling techniques; hence it cannot be guaranteed that the sample frame is fully representative of the entire population, and consequently completely unbiased generalisations are not possible. However, in the view of the authors, considering the relatively limited number of people with area specific expertise within the target organisations, the results can indeed be considered as giving a reasonable indication of the general views and opinions within the subject researched.

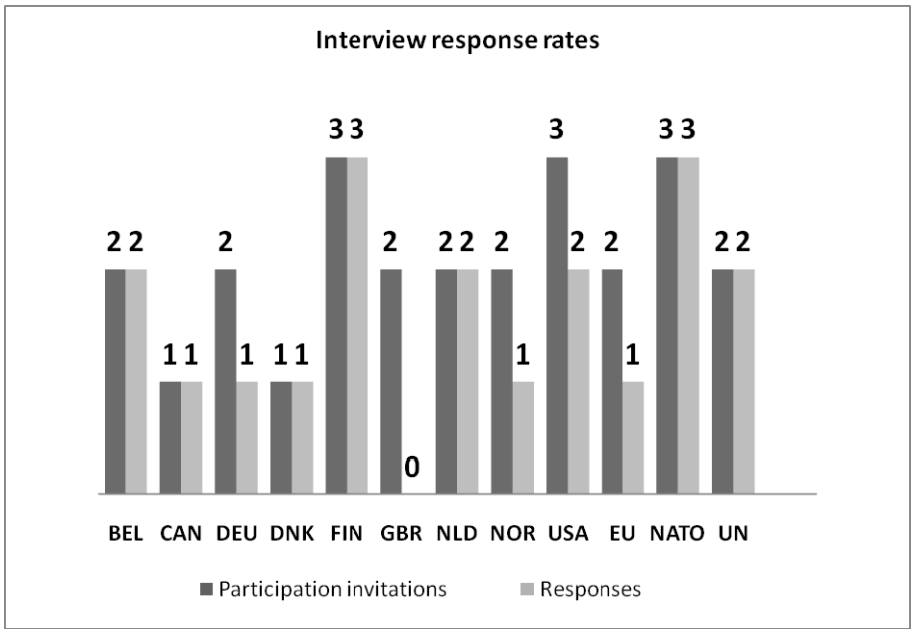

Figure 3. In the diagram the distribution of participants concerning country or multinational organisation is illustrated.

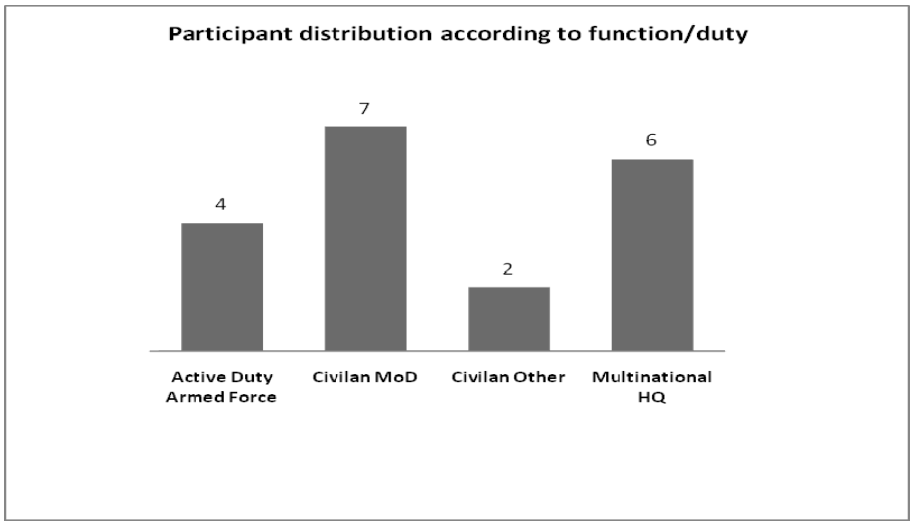

Figure 4. In the diagram the distribution of participants concerning different functions/duties is illustrated.

6.2 Results and analysis

The choice to use semi-structured interviews with open ended questions allowed the participants to discuss the subjects quite freely. This in turn made it possible to capture the participant's own opinions of the subject much better. The responses, however, varied a lot regarding the level of detail and number of aspects raised. An initial analysis of the information shared by the participants in the interviews made it possible to identify key themes, which would serve as the basis for more in depth analysis.

It is important to note that the answers given from the interviews in no way can be interpreted as representing the view of the country or organisation in question. Rather, the information given is reflective of the opinions from individuals. The answers are used to investigate if experiences from working with environmental issues in peace operations are similar over a wide range of countries and organisations, and thus can be generalised in some regard.

The following sections present a summary of the answers given. Where appropriate these have been merged and clustered into themes due to variations in level of detail in the responses provided and that there may be multiple answers to a question from the same person.

6.2.1 Drivers for environmental considerations

"If the leadership links EP with mission effectiveness we will succeed in EP"[128]

Planning phase
The respondents were generally in agreement that environmental policies seem to be motivated in the planning phase by stating that good environmental practices support the mission in several (see figure 5) - not seldom interrelated - ways.

Q1: How are environmental policies motivated in the planning and execution of complex peace operations?

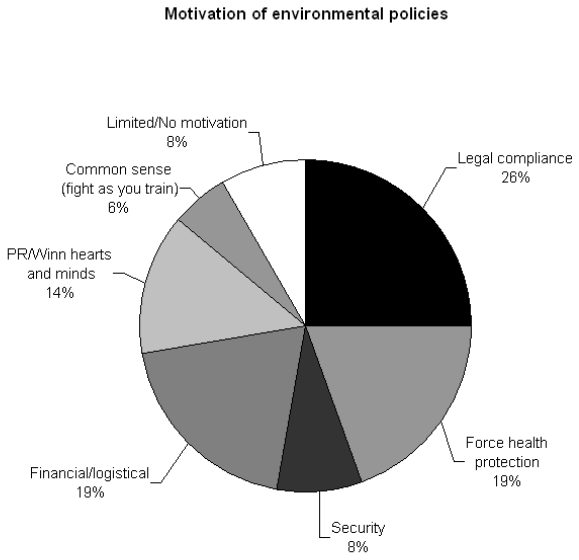

Figure 5. The chart illustrates the motivation for environmental considerations in the planning and execution of complex peace operations. The percentage in the diagram refers to the share of total answers.

As displayed in the chart, **legal compliance** was the strongest theme (~26 %).[129] There is an obligation to respect the laws of the sending nation, the host nation as well as international environmental agreements and regulations by the sending entity. Compliance to such regulations might prevent liability claims, which can carry financial as well as reputational implications.

[128] Respondent 16

[129] Respondents 1,4, 8, 9, 12, 13, 15, 17, 18

The second most common answer was **force health protection** and **financial/logistical** motivators respectively, mentioned by 19 %[130] and ~19 %[131] of the respondent's respectively. By, for instance, properly managing the waste produced pests can be prevented and diseases may be avoided. Energy and water conservation also reduces risk for the convoys that transport the fuel as well as increasing the self sufficiency of the camps. Reduction of logistical cost on the other hand, i.e. by promoting energy efficiency pays off by a decreased fuel need and waste minimisation reduces lower cost for waste disposal. Remediation of polluted soil and water is also very expensive[132].

Public relations/"hearts and minds", that is, winning the confidence of the local population by showing that you have respect for the environment of which they are often depending for their livelihoods, was mentioned by 14 %.[133]

Security was mentioned by 8 %[134] as a motivating factor: if the personnel while conducting peace operations pollute ground water or destroy cultural heritage this will reduce the overall security for the personnel operating in the theatre. Furthermore, by being more resource efficient the dependence on provisions decrease and the operation can operate more self sufficient.

The notion that you should train as you fight – and fight as you train, i.e. apply **common sense** was also mentioned (6 %).[135] The idea is that since most (developed) nations have environmental provisions included in their manuals for domestic training and exercises, there is no reason not to maintain reasonably high standards during a peace operation too.

Lastly, 8 %[136] responded that there is **none or very little motivation**. Unless there is a forceful personality in the planning and operational management whom is motivated to push environmental concerns the issue would receive little, if any, concern. As of today, the environmental policies are not yet integrated with the other policies used for planning and execution.[137]

Execution phase
In addition to the drivers for "motivation environmental considerations" in the planning phase, a proactive approach by the environmental professional (i.e.

[130] Respondents 1,6, 7, 9,11, 13, 17
[131] Respondents 6, 8, 9, 11, 12, 13, 17
[132] Nielsen *et al.* 2006
[133] Respondents 6, 8, 11, 13, 17
[134] Respondents 7, 12, 13
[135] Respondents 11, 13
[136] Respondents 16, 20, 21
[137] Respondent 20

personal motivation and drive) will decide whether an emphasis is put on environmental issues during the execution phase of operations, according to several respondents.[138] In fact, it was stated that the level of provisioning of environmental personnel within the planning phase directly and significantly influences the effectiveness of environmental considerations during the operational phase.[139]

In addition, it was stated that the motivators between the strategic and operational tactical levels may vary, meaning that the legal compliance as well as the "good will" motivators will weigh more heavily at the strategic level, whereas force health protection and logistical motivators are more predominant drivers at the tactical level.[140] As mentioned by one respondent:

"Whether environmental considerations are included into strategic and operational planning will serve no purpose unless actions are taken at the tactical level. Planning is great but we must insure that resources are allocated so that the appropriate actions are taken in the field"[141]

6.2.2 Challenges for implementation

"Generally speaking, the military are good at reacting to environmental issues/actions but we need to work at better planning and allocating resources for environmental matters"[142]

The second question has been developed to answer queries around what primary difficulties and problems that exist in integrating environmental considerations into strategic and operational planning (figure 6).

Q2: What difficulties and problems do you see as primary for the ability to integrate environmental considerations into strategic and operational planning?

[138] Respondents 3, 15, 16, 21

[139] Respondent 18

[140] Respondents 17, 19

[141] Respondent 3

[142] Respondent 3

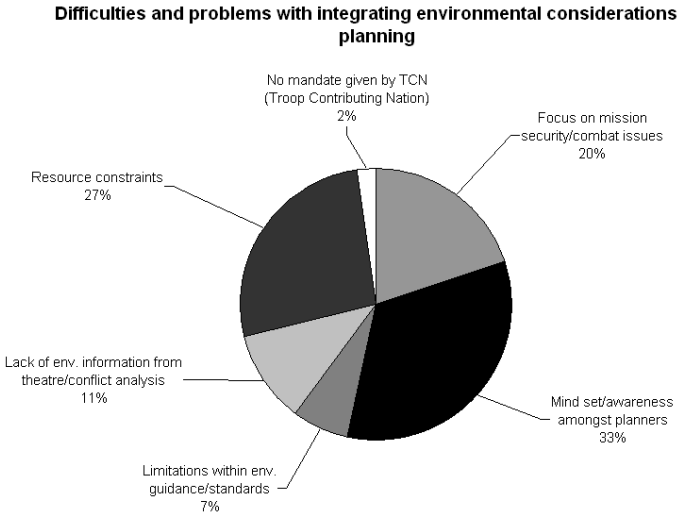

Figure 6. The chart illustrates some of the difficulties encountered for integrating environmental considerations. The percentage in the diagram refers to the share of total answers. A breakdown of the resource constraints is shown in figure 7.

The majority (33 %[143]) argued that the current **mind set** and/or **lack of awareness** contributes to the difficulties for integration into tactical and strategic planning. It was also argued that many people on strategic and operational planning staff also seem to have a misunderstanding of what environmental considerations are. Most non-environmental planners regard environmental considerations as an additional constraint or requirement to be dealt with in isolation. One of the challenges for the environmental planner's at the strategic and operational level is therefore to link environmental aspects to operational objectives.

The second most common reason (27 %)[144] was **resource constraints**, which in some cases was specified with the type of resource: i.e. lack of time, funding, staffing etc. (figure 7).

A focus on **security issues** and/or **operational constraints** was mentioned by 20 %.[145] It is commonly acknowledged that not much ever goes exactly as planned in a military operation and high operational tempo may result in a necessity to assign as many personnel as possible to combat related tasks, making environmental considerations in the field difficult to implement.

[143] Respondents 1, 3, 6, 7, 8, 9, 11, 12, 16, 17, 18, 21

[144] Respondents 1, 3, 6, 7,8, 9, 11,12, 13, 14, 15,17

[145] Respondents 1, 3, 6, 7, 8, 9, 11,16, 18

To properly integrate environmental considerations into strategic and operational planning sufficient reliable environmental data from the area of operation is needed. Sometimes the data is inaccurate or unreliable or simply just not available. This deficiency regarding **environmental information** in conflict analysis was emphasized by 11 %[146] of the respondents.

Limitations within existing **environmental guidance and or the lack of common standards** as a matter impacting the interoperability between nations was also mentioned (7 %).[147]

Finally, **no mandate by troop contributors** were mentioned (2 %)[148] meaning that in multinational operations there sometimes has to be a consensus among the member states which might lead to quite unambitious "common denominator" solutions.

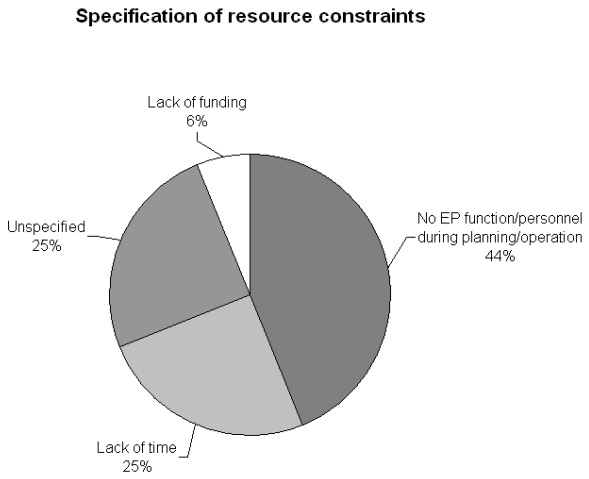

Figure 7. The chart illustrates the breakdown of resource constraints, where possible, into lack of staffing, lack of time and lack of funding. The percentage in the diagram refers to the share of total answers

With respect to lack of resources (figure 7), a major problem perceived by the respondents (44 %)[149] is **the availability of trained environmental staff** - or rather *the lack* of trained staff in Departments/Ministries of Defence, multi-

[146] Respondents 7, 8, 11, 13, 17

[147] Respondents 4, 7, 21

[148] Respondents 20

[149] Respondents 1, 3, 7, 8, 9, 12

national headquarters and/or national defence forces, especially active duty officers. Additional challenges could be that strategic planning groups may intentionally be kept compact in order to preserve their work efficiency.[150] In addition, at the tactical level the environmental officer may not be a career officer and/or have limited experience from deployment situations which may result in him/her being over looked when giving recommendations because of rank and/or experience.[151] One respondent thought that:

"It is very hard to get the authorities to assign "real live people" to tasks in the field implementing the policies"[152]

Lack of time (25 %) and **lack of funding** (6 %), predominantly for environmental equipment and surveys were also mentioned as constraints.

6.2.3 Environment - mission success nexus?

"We need to put more efforts to produce and offer suitable environmental information (cause and effects) to peace keeping personnel. It is good to remind that in many crises environmental degradation / problems are driving forces and the welfare of the society is connected to the environment conditions before, during and after the operation. Security environment and environmental condition are closely connected".[153]

The overall consensus (61 %)[154] of the respondents was that an increased emphasis on the importance of environmental issues for mission success indeed would likely facilitate the integration of environmental considerations into strategic and operational planning (figure 8).

Q3: Could increased emphasis on the importance of environmental issues for mission success facilitate the integration of environmental considerations into strategic and operational planning?

[150] Respondents 9

[151] Respondent 15

[152] Respondent 12

[153] Respondent 7

[154] Respondents 1, 2, 7, 8, 9, 12, 13, 15, 16, 17, 18, 20, 21

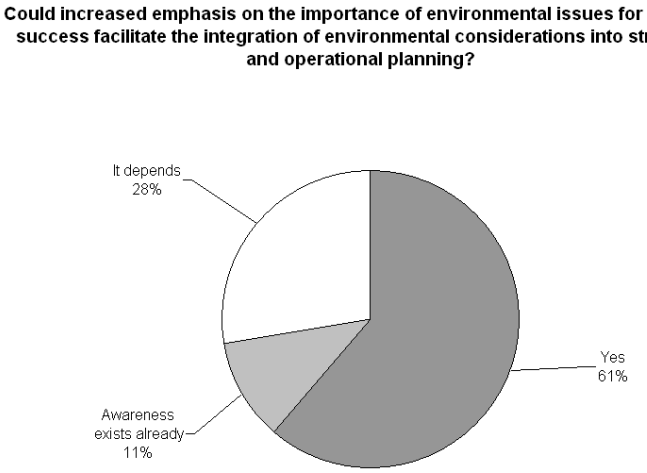

Figure 8. The chart illustrates the response to whether an increased emphasis on the importance of environmental issues for mission success indeed would likely facilitate the integration of environmental considerations into strategic and operational planning. The percentage in the diagram refers to the share of total answers.

Other respondents (11 %)[155] argued that commanders and officers are well aware of the environmental issues for mission success but there is insufficient emphasis on them. An appropriate level of resources needs to be allocated and actions taken at the tactical level.[156]

Yet again others (28 %)[157] thought that **it depends**, leaving the response very much open ended. One of the respondents thought that this question is best answered if first it is clearly defined what the mission is.[158] In the case of complex peace operations, the mission in fact is not just traditionally military, i.e. the defeat of the enemy, but rather the establishment of a viable, sustainable peace with good governance. Paramount to reaching that desired end state is to ensure that the peace operation itself does not create and leave environmental problems that would stress the capabilities of a new/ emerging government. In many cases, success in this area would begin with sound military practices during the operation. In other words, emphasis on the importance of environmental issues for mission success is a prerequisite for environmental consideration in strategic and operation planning. A good way to "sell" environmental considerations is hence

[155] Respondents 3, 11

[156] Respondent 3, 11

[157] Respondents 6, 14, 19, 20, 21

[158] Respondent 14

to stress the operational benefits *"rather than setting up a list of constraints on what must be done*".[159]

Finally, the need to more proactively address environmental issue in the mission success context, such as including it in conflict analysis, was raised. As one respondent put it:

"Proper analysis of contributing factors of the conflict is the primary role of the strategic and operational planners. From my limited experience here, I've seen an insufficient amount of time to properly frame problems and don't have sufficient data to properly analyse how environmental aspects may be causing the conflict."[160]

6.2.4 Organisation

A follow up question regarding "organisation" were answered by nine people (six nations and two multinational organisations). The respondents mostly described how the organisations look today and some ways to improve them, rather then discussing the "ideal" organisation.

Q4: What should an organisation ideally look like in order to make sure environmental considerations get appropriately addressed (as opposed to how it may look today)?

One respondents believed that it is important to better integrate environmental considerations in the operational planning process, for instance by including participation of environmental expertise in joint planning groups when the Component/Combatant Command charged with the responsibility of the operation issues the OPLAN.[161] Furthermore environmental expertise need to be deployed to the theatre during the initial operational reconnaissance, deployment and operation phase[162], the re-deployment phase and finally be part of the lessons learned process.

A re-occurring theme in the responses was that that since the military organisation is rather "stove-piped" and hierarchical environmental expertise get involved too late in the process, which limits the resources allocated to environmental functions. Furthermore, a prerequisite for environmental considerations in such a traditionally hierarchical organisation is a general awareness and buy in for the idea that environmental issues in fact are critical for mission success.[163] A more flat organisation would, according to one respondent, probably increase the like-

[159] Respondent 17

[160] Respondent 17

[161] Respondent 13

[162] Respondent 11

[163] Respondent 13

lihood of environmental considerations being properly addressed and communicated.[164]

Some suggestions for the ideal organisation were that it should have an EMS in place, with a policy that is regularly reviewed as well as good monitoring and enforcement capabilities. There should be a training and awareness program adjusted to match various organisational levels. A compulsory training should also take place for all staff to increase the understanding of what is expected from each and everyone. In addition, environmental expertise should be attached at the management level and operational areas have an environmental planning officer. In theatre there should be engineering areas that are specifically environmentally directed and an environmental unit that runs environmental assessment, in theatre training, monitoring etc.[165]

One existing organisation that believed they had progressed had a SOP that guides environmental considerations that should be performed throughout the phases of an operation in use since August 2010. The planning of an operation starts with a "Joint Planning Meeting" with the purpose of getting general information on the area of operations, the mission objective etc. The following step is a desk study to maximize the information on the country, including host nation legislation. In the fact finding mission that follows, additional information on the local situation including environmental infrastructure/material in place, local directives etc are gathered. The consolidated information acquired forms the basis for writing the environmental annex to the Operation Order (OP-order). Prior to deployment, a briefing for the environmental advisor of the contingent takes place (iterated for each rotation). During the mission, the MoD assists the deployed environmental advisor and his/her commander and the advisor submits monthly reports on the situation on the ground to the reach back function. These reports informs an "environmental file" that serves as a repository to be used e.g. for the closing survey at the end of the operation.[166]

[164] Respondent 1

[165] Respondent 6, 20, 21

[166] Respondent 2

7 Discussion

The performed interviews and review of previous studies have confirmed and added to the Swedish experiences of dealing with environmental considerations in peace operations. Environmental aspects are not included in the planning process, the awareness of their importance is low and, consequently, they tend to become a low priority in comparison with other activities (perceived to be more of the core business). The level of attention that environmental issues get in an operation is often directly dependent on personal involvement and devotion.

This is not a situation unique for the military sector. A quick glance also at other Swedish public organisations such as the Swedish International Cooperation Development Agency (Sida)[167] shows much of the same challenges for implementing environmental considerations; a low legitimacy of environmental issues, a lack of understanding of the field and a lack of clear priorities between many different tasks.[168] Work aiming at safeguarding the environment can even be perceived to negatively impact aspects that are prioritised.[169] Personnel assigned with environmental responsibilities also often perceive themselves as having low status in the organisation.[170]

It is obvious that environmental considerations in peace operations are a responsibility that goes beyond the tasks of an environmental officer, even though such a function does not exist for all operations. Environmental considerations are a cross-cutting issue, and should hence be treated as such, i.e. be integrated in all relevant processes (be mainstreamed[171,172]). As expressed in the interviews: *"Environmental considerations must be a part of everyone's job."*

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[167] Brunnström *et al.* 2006. The staff was not familiar with how to implement the environmental policy, and environmental issues were not highly prioritised.

[168] Olausson and Roos 2008

[169] One example can be found in the private construction industry, environmental work was perceived to negatively impact short-term profit, cost savings, and on productivity, the three aspects that were prioritised. Pernilla Gluch (2005), Building Green. Perspectives on Environmental Management in Construction, Building Economics and Management Department of Civil and Environmental Engineering, Chalmers university of technology, Göteborg, Sweden, 2005

[170] Tilling 2008

[171] IIED (2009): Environmental mainstreaming - the informed inclusion of relevant environmental concerns into the decisions and institutions that drive national, sectoral, and local development policy, rules, plans, investment and action.

[172] Environmental mainstreaming (EM) has been found to cover e.g. leadership, integration, dialogue, ownership, subsidiarity, transparency and accountability. EM may have a spectrum of outcomes, from "upstream" changes, like influencing a policy or a plan, to "downstream" changes, i.e. in behaviours and delivering environmental improvements "on-the-ground", see for example Dalal-Clayton and Bass 2009

Collectively changing the mindset requires some basic environmental education for all involved.[173] Environmental awareness needs to be fostered into decision makers, including the awareness that environmental factors can interact with other aspects, like security and economy. Appropriate documents to guide this work should be in place for different processes and stages. These topics are discussed further below. There is no clear-cut boundary between the chosen topics, or rather; suggested actions in one area might most likely result in improvements also in others.

7.1 Environmental policies, doctrine and management

It is not the absence of an environmental policy that is the reason for insufficient environmental considerations in peace operations. Assigning a policy to a specific issue is one way of underlining its importance. Having an environmental policy can almost be seen as a prerequisite for necessary actions, otherwise it has proven to be more or less a matter of personal involvement of dedicated personnel.[174]

However, policies and doctrine show the overarching intentions, sometimes without stating goals and objectives. Phrases such as "take reasonable care"[175], or as in the Swedish Armed Forces' environmental policy "shall strive to" are used. Environmental policies must perhaps seek to ensure that the actor keeps some freedom of action, resulting in that guidelines and usability on an operational/tactical level is seldom provided. There are examples of environmental policies accompanied by an implementation or action plan in which goals have been broken down into objectives, suggested actions and different parts of the organisation and processes concerned.[176] This creates clarity of what the rather diffuse goal might mean to different actors, not least in terms of responsibility. When responsibility is not stated, there is a big risk that no stakeholder on his/her own initiative takes on this challenge, especially when it is to be handled within given resources.

[173] This is also one of the ambitions expressed in the Swedish Armed Forces environmental policy.

[174] This fact is for instance expressed in the UN DPKO/DFS draft environmental guidelines Page 2, D.1-7 that states; In the past, those [environmental] issues were often dealt with on an ad-hoc basis by individual missions relying upon their own assessment of environmental problems and voluntary actions of individual members of the respective missions. Although staff members working at field missions were frequently aware of the need to address such matters, the lack of guidance concerning environmental issues made it difficult for them to take practical measures.

[175] See for example Ministry of Defence United Kingdom 2009; NATO 2003a

[176] See for example University of South Carolina 2001

As part of the mainstreaming, environmental provisions should form part also of relevant strategies and governing documents, other than environmental policies.

The above mentioned actions are natural parts of an EMS. Hence, if the Swedish Armed Forces are successful in implementing an EMS as planned, many of these parts should fall into place. However, if peace operations are exempted from the system, the environmental considerations in them must be specifically attended to by other means and processes.

7.2 Environmental awareness and training

It is not realistic to aim for deep environmental knowledge for all personnel throughout the Swedish Armed Forces. However, an increased awareness of environmental issues through basic education and information is desirable. A minimum requirement is an understanding of in what processes more extensive knowledge is needed and hence must be obtained from other parts of the organisation.

In the operational planning process, a basic knowledge of the impact of military actions on the environment and how to mitigate them should be a requirement. All possible secondary or tertiary consequences cannot be foreseen, even with thorough planning, but with an awareness of the interaction between environmental issues and other factors, many of the gravest mistakes can hopefully be avoided.

If environmental provisions are included in manuals and handbooks for training, it is reasonable to include the same requirements to maintain a high standard during a peace operation too; *train as you fight – and fight as you train*. With proper environmental pre-deployment training, there are possibilities to address these issues to some extent, even in the very hectic and intense phases of an operation. This includes using experiences from previous operations. Numerous variables affect conflict and peace dynamics and outcomes, and useful conclusions can therefore not be readily transferred to other conflict contexts.[177] However, discussions on experiences in terms of consequences and actions are useful to point at the far reaching importance of environmental issues.

[177] OECD 2008

7.3 Operational planning and follow up

The possible connections to the role of environmental factors in the conflict are seldom regarded to any notable extent in the early planning, even though many of the strategic foresights point at environmental changes, especially climate change and completion of energy resources, as contributing to security risks.[178]

If environmental factors are not considered in the early stages of operational planning, there is no real foundation for the environmental officer to stand on, if that function even exists. Looking at the strategic planning processes benchmarked for the development of the Swedish EBAO concept, environmental considerations should be an integral part of a conflict analysis. This would in turn reflect on the ways and means to attain the ends. The purposeful assessment to measure progress would benefit from the inclusion of environmental factors, both their possible effect on the fast dynamics and on the more slow processes in the community.

Especially in the onset of the operation, there is often a perception that there are too many other factors to consider. The environment is not perceived as a core business resulting in a low priority. The capacity to address environmental considerations in the early stages of an operation, and when the tempo is high, is thereby weak. Nevertheless, there are always some environmental factors that are relevant in all types of conflict areas such as: vulnerable natural environments or resources and weak governmental institutions and institutional capacity. By, for instance, making an environmental vulnerability assessment (EVA), vulnerabilities can be identified and mitigating measures can be designed.

Important operational planning documents are COPD, OPLAN, OPORD, SOPs, and FRAGOs, with different levels of detail as to how to perform tasks. For example, there should be an environmental annex to the OPLAN, which provides some assumptions as to environmental threats and risks, as well as availability of critical resources necessary to implement and execute the task associated with the protection of the environment. This annex may be too generic to consider the unique environmental features of the area of operation, and further, no secondary and tertiary unintended consequences are addressed. A FRAGO is instead developed as the situation changes and states what must be done to make up for the change.

A systematic process to gather environmental information was shared in the interviews. A SOP states environmental considerations to be performed throughout the operation. The planning process starts with a joint meeting to collect

[178] Ministry of Defence United Kingdom 2010

general information, followed by a desk study on the country and a fact-finding mission. The collected information is used to develop the environmental protection annex of the OPORD. The environmental advisor of the contingent is assisted by the MoD. Monthly reports inform an “environmental file”.

7.4 Organisation

To successfully implement environmental considerations in peace operations, they have to be acknowledged throughout the organisation, not the least by decision makers. Effective environmental management and mainstreaming of environmental considerations is dependent of command emphasis on the issue. In the present organisation of the Swedish Armed Forces, environmental competence is spread out, and is lacking at strategic positions in the organisation. This should therefore be reinforced, to be able to give adequate advice in the relevant processes, e.g. when it comes to planning of operations.

During an operation, the Swedish EHO is a civilian, with a military rank during deployment, and environmental protection is then only a secondary task. Furthermore, the environmental function is often placed with the Logistics Branch. This may be the proper position when it comes to handling technical, infrastructural issues, but will not provide the optimal channels for addressing more complex questions. The environmental function should therefore be strengthened, or split into two, to also become a valuable advisor to the commander, with better opportunity of participating in planning processes and communicating appropriate actions. This can be compared to the Gender Advisor, who often is a member of the commander’s advisor group.

As suggested in the interviews, at the very least there should be an environmental policy that is regularly reviewed, an EMS in place and training and awareness programs adjusted to match various organisational levels. Environmental expertise should be attached at the management level, and the operational areas should have an environmental planning officer. In theatre, there should be an environmental unit (environmental management board) that deals with operational environmental issues.

It may be difficult to find all the required competence in one single individual, partnership and networks are therefore paramount. Reach-back support during an operation is paramount and it is of great importance that desk officers at the home station firstly, have the competence to identify environmental questions when they arise from the operation area, and secondly, can identify the proper receiver of the question/request.

7.5 Drivers or motivators for environmental considerations

If environmental considerations are not properly addressed in the planning and execution phase of an operation, they can be non-conducive to soldier health, can increase the overall costs and make it more difficult to sustain the mission and even achieve overall mission success. However, quite the opposite, there seems to be quite a widespread perception that environmental considerations are costly and counter to operational success. When environmental tasks are to be performed within given resources, they can be seen as an additional burden to an already heavy work load or strained resources. A better understanding of the complexity of the operational environment in the theatre and of the environment as a possible factor for conflict solution is paramount.

Also, it seems that the notion of "the environment" is sometimes too wide to conceive, and possible negative consequences that are not immediate can be quite easy to disregard. It has also been observed that the moral responsibility of not hampering the environmental situation rarely is a good enough driver for including environmental considerations, but rather that other drivers are.

There are different drivers for different levels and functions in an organisation. Traditionally, force health protection and avoidance of legal claims have been the principle drivers. However, other arguments deserve to be raised, like the ability to support the mission, the legitimacy of the operation and security issues in a broad sense. The local population may have high expectations that the situation will quickly change for the better. A failure to achieve this may result in discontent. Even worse, the foreign forces may be looked upon as a threat, if it is perceived that they are contributing to negative environmental and/or health impact, or over-/misuse of natural resources. In gaining the confidence of the local population, and thereby an improved security situation, showing a respect for and care of the environment in which they live, can be an important success factor.

A better understanding of the importance of environmental issues for the accomplishment of mission goals could hence be accomplished by communicating the appropriate driver to each level and function. If everyone at all levels in the organisation understand environmental risks, environmental issues can compete with operational requirements to obtain appropriate resources in a risk management/risk avoidance system.

8 Conclusions

The rather scattered picture of what challenges may arise to operationalise environmental considerations in peace operations have through this investigation become more comprehensive. Some of the findings relating to the questions the study sought to answer are given in bullet form below.

1. Which environmental policies or other strategic or high level documents in the field of military operations exist and are peace operations specifically addressed?

- many nations as well as the UN and NATO have developed environmental policies and doctrine for environmental considerations in peace operations and made them effective
- several NATO member states have adopted the framework of i.e. NATO environmental policy and doctrine
- environmental management systems (EMS) are promoted as the framework for environmental considerations
- the general focus of the policies is often on complying with national (or host nation) legislation, as well as international conventions
- topical focus areas include waste management, hazardous materials management, natural resources management, cultural and historical resources management and energy use
- the relation between environmental factors and conflict/conflict solution is generally not stated
- environmental aspects, and their connection to security, especially climate change and energy, are starting to find their way into strategic future outlook studies

2. What are the main difficulties with handling environmental issues in peace operations?

- there is a gap between environmental policy at a strategic level and the implementation of the policy at the operational /tactical level, hence environmental considerations are not well incorporated into operations
- there is a lack of line accountability as a policy moves down through the chain of command
- policies are not well adapted to requirements of an operational setting and have not been transformed into easy–to-understand environmental guidance available in the field
- nations deployed in peace operations are not obligated to comply with environmental requirements to the same extent as their domestic installations, and hence environmental considerations are not regularly enforced
- in general, there is a low interest from senior military leadership in environmental issues

- success is often related to personal dedication of the environmental officer
- for non-technical environmental issues, the environmental function is not adequately positioned in the operational organisation and do not often "have the Commander's ear"
- there is a lack of resources, including time and there is also insufficient environmental training and awareness
- secondary and tertiary unintended consequences often arise as a result of inadequate planning (e.g. control of the whole chain of waste disposal)
- environmental factors can have effect on the security situation (e.g. distrust and lower legitimacy for the operation
- knowledge transfer is insufficient; lessons identified in the field are not being captured and transformed into lessons learned

3. What can be done to overcome the difficulties encountered, enabling environmental considerations to be "operationalised"?

- environmental mainstreaming in the organisation
- include environmental competence at strategic positions in the organisation
- break down the environmental policy into concrete goals, objectives, action plans, and state responsibility
- introduce an environmental management system to organise the environmental efforts
- change the mindset through basic environmental training for all
- include environmental considerations in operational planning (e.g. conflict analysis)
- increase awareness of the interplay between environmental parameters and other parameters (e.g. security, resources, and even conflict solution), and the possibility of secondary or tertiary consequences
- include environmental considerations in pre-deployment training
- enforce the lessons-learned process by e.g. introducing an "environmental file"
- create an environmental unit/management board in the operation

Mainstreaming of environmental considerations is dependent of command emphasis on the issue, as well as the capability of the environmental community to prove the benefits in terms of force health protection, cost savings, and increased security. Integrating environmental considerations also sustain natural resources management, reduce the logistics footprint, promote positive relations with the host nation, and support post-conflict stability efforts.

The inclusion of environmental considerations in operational planning fits well into the current development of the concept of EBAO, which includes a broadened perspective regarding operational goals and means of achieving them. Not including environmental consideration in the planning and operation may be contra-productive to the overall aims of a peace operation; namely, saving the

lives and livelihoods of the people suffering from a conflict. This is especially important as peace operations are often performed in areas or regions already environmentally vulnerable and/or stressed. There are tools to identify vulnerabilities, which would allow for planning of mitigating measures. Environmental provisions in manuals and handbooks for training increase the possibility of considering the environment also during an operation, even when the tempo is high. It can be difficult to apply lessons learned from one peace operation to another conflict environment as so many parameters affect the context; however, experiences should be handled in the lessons-learned process.

Also, although policy and planning may be the entry points, it must also be ensured that resources are allocated so that the appropriate actions can be taken also in the field. At the end of the day, even if environmental considerations are included into operational planning, they will serve no purpose unless actions also are taken at the tactical level. This will only happen if the actions make sense to the ones that should implement them.

8.1 Recommendations for the Swedish Armed Forces

In this section, some recommendations are given on how to integrate environmental considerations in peace operations. In figure 9, the different recommendations are schematically illustrated and linked to specific phases in the operational life cycle.

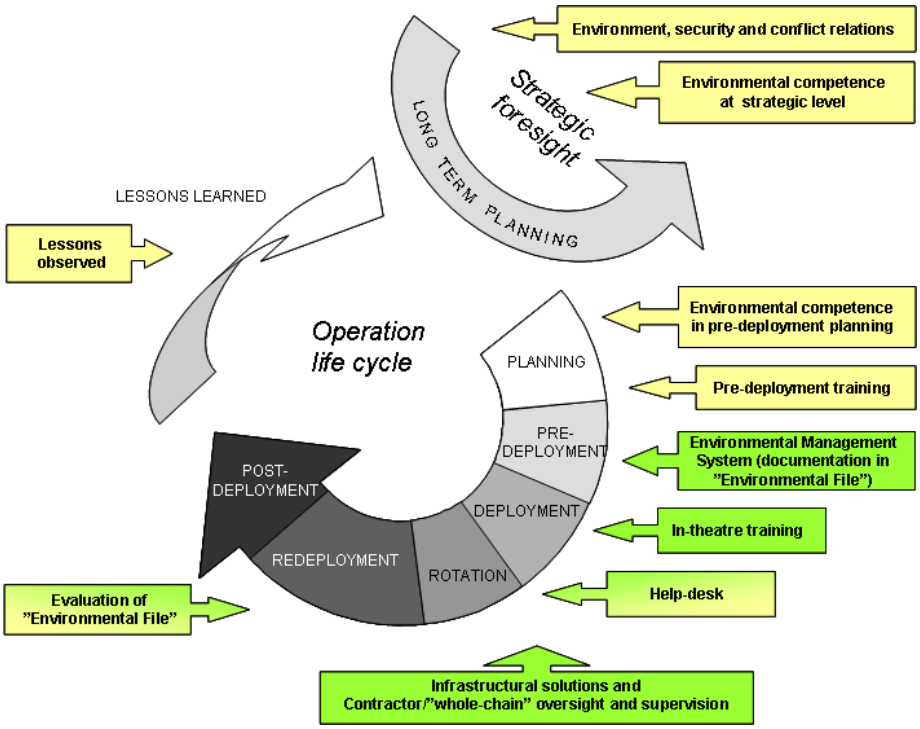

Figure 9. A simplified and schematic picture of the operational life cycle showing where and by which means there are possibilities for improving the ability to more fully include environmental considerations. The yellow arrows indicate suggested achievements at home; the green arrows specify in-theatre tasks/efforts.

Much of this work must be initiated prior to the planning of an actual operation, for instance, in the decision making process. However, there must also be an awareness of the importance of these issues at strategic positions as well as at the operational and tactical levels in the organisation. This study has not identified specific actors or resources to manage this process; it does however provide some arguments to facilitate matters. Some recommendations are given below:

- Create a change of mindset – acknowledge the importance of environmental competence in strategic/long term planning and secure this competence at the strategic level (as well as at operational and tactical levels).

- Enhance environmental awareness through training at *all levels* e.g. an environmental module in officers' training/programmes and in garrison training for everyone.

- Include environmental factors in overall strategic foresight and develop a "Strategic environmental outlook" for the Swedish Armed Forces.

- Increase the awareness of the interrelations between environmental stewardship and mission success in support of a fair and sustainable global development.

- Increase the understanding for the environment-conflict nexus by including the results from EVA in the operational planning.

- Include environmental competence in pre-deployment planning to ensure that environmental factors are included in conflict analyses.

- Enforce the critical decision points identified (by the camp protection advisory committee) where environmental considerations need to be addressed in order to ensure mission success.

- Conduct generic and mission specific pre-deployment and in-theatre environmental training.

- Introduce an EMS and collect all environmental information in an "environmental file".

- Create an environmental help-desk/reach-back function.

- Create an environmental management unit/board in the operation to facilitate the EMS including a better management of strategic/"non-technical" environmental issues.

- Facilitate the multipurpose case of safeguarding the environment by applying a "do less harm" approach, e.g.
    - Calculate return of investment for environmentally sound base camp infrastructure; conserving resources and minimising waste/ pollution to prove the multi-purpose case of safeguarding the environment, maintain troop health and save money.
    - Ensure base camp infrastructure for e.g. solid and liquid waste management, hazardous materials management and energy/water conservation in advance, and create conditions for "whole chain" contractor oversight and supervision to be executed accordingly.

- Enforce lessons learned processes, e.g. evaluation of the "environmental file".

8.2 Proposed future research

Environment-related issues are likely to have an impact also on the conflicts or tensions of the future. This can affect the required future military capability, e.g. through new types of missions in new geographical areas. It is therefore relevant to look further into how environmental factors can be used to forecast state fragility as well as develop a strategic future environmental outlook.

Attending to environmental mainstreaming also poses some challenges. In addressing environmental issues in development policy-making and decision-taking, some initial challenges have been identified,[179] e.g. identifying what is holding actors back from a full consideration of environment; spotting and exploiting entry points into processes, identifying the drivers (notably policy concerns and initiatives) that are open to environmental integration, making sure that environmentally-dependent (and often marginalised) groups are heard. Looking into what would be the adequate actions for the Swedish Armed Forces would be relevant for a successful environmental mainstreaming. Relating to this is an investigation into why and how the implementation of gender issues has been more successful when compared to that of environmental issues. In the case of successful mainstreaming, the next step would of course be to investigate whether it makes a difference in the performance and success of peace operations.

8.3 Closing comments

The environment, the economy and society are interdependent dimensions, which is reflected in the concept of sustainability. According to both the Swedish policy for global development[180] and the national strategy for participation in international peace-support and security-building operations[181], the aim with Swedish international interventions is to contribute to a fair and sustainable development. Hence, the very participation in a peace operation has environmental aspects in its core. Including environmental considerations into the planning and other stages of such a peace operation is thus essential. Also, many of the strategic outlooks studied point at environmental change, (e.g. climate changes) as contributing to security risks in the future. Extreme weather conditions are expected to impair living conditions in many already vulnerable parts of the world. Second order effects, such as intensified competition for scarce natural resources and weakening of some societies' already low capability to cope with

[179] Dalal-Clayton and Bass 2009

[180] Swedish Government 2002

[181] Swedish Ministry for Foreign Affairs 2007

conflicts and crises, might be the result.[182] It is likely that environmental factors play a role in the conflict and thus possibly in the solution of it. An intervention such as a peace operation may further exacerbate the situation, unless planned or executed in a manner that takes local environmental aspects into consideration. This in order to be able to make informed decisions on e.g. how to effectively use available resources, as well as assessing and mitigating unintended negative consequences detrimental to mission success.

There is in fact a need for wider recognition of the importance of environmental factors, and a better integration of them in the everyday processes and organisational structures of the Swedish Armed Forces. Environmental mainstreaming could help to find integrated solutions that avoid putting the environmental considerations in contrast to other mission goals. This would include a review of the environmental policy to ensure that it is adequately covering the intentions, a development of an implementation plan, and introduction of an EMS. Environmental expertise should be attached to the strategic level, and a function as environmental planning officer could also be introduced. In theatre, there should be an environmental unit that deals with operational environmental issues. Training and awareness programs should be developed and adjusted to match various organisational levels.

It is important to point out that the intention of this report is not to assign environmental considerations a top priority in all activities conducted by the Swedish Armed Forces. It is however important to have a comprehensive understanding of "the bigger picture" when it comes to environmental considerations in peace operations, revealing that environmental considerations can in fact be a mission enabler, instead of a strain on limited resources.

[182] Dreborg *et al*. 2008

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Appendix 1 - Environmental terms and definitions

Some of the terms related to environmental aspects that are used in the report are discussed in table 1. In addition terms of strategic importance and use are mentioned here, even if some of them are not further used and discussed in the report, such as sustainable development and environmental security.

Sustainable Development

The term s*ustainable development* was coined by the Brundtland Commission as development that "… meets the needs of the present without compromising the ability of future generations to meet their own needs".[1] In the broadest sense, it means the balancing of economic, social, environmental, and technological considerations, as well as the incorporation of a set of ethical values. In a military context, it is a model of resource use that aims to meet military operational needs while preserving the environment, so that its resources can be available not only in the present, but also in the indefinite future.

The term is used as a common denominator for the desired strategic end state of peace operations in general. The term is discussed in the NATO environmental policy[2] and the UN DPKO/DFS environmental policy and the environmental guidelines draft.[3] The EU has also made efforts to incorporate sustainable development into its political structure as a guiding principal and strategy. It is an overarching objective of the EU set out in the treaty[4], governing all EUs policies and activities.

Environmental Security

In the last decades the topic of *environmental security* has found its place both in research and on the political agenda. Different scholars, including military thinkers, have focused on various aspects within the wide range of environmental security. Some of the writing has focused on the impact of environmental change on the national security of a particular state, whereas other efforts have been primarily concerned with the consequences for global security and in recent years more particularly the security implications of climate change. Others in turn, have focussed on the environment as means to dialogue and conflict resolu-

1 The World Commission on Environment and Development (The Brundtland Commission.) 1987

2 NATO 2003a

3 UN DPKO 2009a; UN DPKO 2009b

4 Treaty on European Union

tion or the environmental impacts resulting of armed conflicts.[5] As pointed out by e.g. Dabelko[6], not everything and anything should be attributed as environmental security. However, in the context of a holistic definition of security, environmental security is a component of national security and hence a component of overall global security

In a guiding document for the Swedish Government Office's work on environmental security (or environment and security)[7], the field is described both as how climate, environmental and resource related issues can be driving factors for conflict, and be a threat to the livelihood of large groups of people (i.e. human security). This is consistent with the views expressed in the research literature,[8] where the concept of security is broader than the traditional one. These factors are seen as an indirect cause, or acting like a threat multiplier, rather than the single cause of conflict. One should not forget the possibility to use the solving of an environmental problem as part of the solution of the conflict or tension, which is also included in this definition.

The Swedish Armed Forces have acted on this rising topic and initiated in 2007 research to identify the implications for their own activities.[9]

Table 1. Environmental terms and definitions

Term	Description
Environment	The surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation.[10]
Environmental compliance	Generally, this means compliance with regulatory documents, like national environmental legislation or host nation legislation. It can be considered as a reactive approach to environmental issues rather than a proactive.

[5] For a review of the development within the field of environmental security see for instance Scott Andersson *et al.* 2007.

[6] Dabelko G. 2009.

[7] Government Offices of Sweden 2009

[8] For example Renner 2006, Halden 2007, Conca and Dabelko 2002, and Brauer 2009

[9] Scott Andersson *et al.* 2007

[10] NATO 2010b

Term	Description
Environmental considerations	The spectrum of environmental media, resources, or programs that may impact on, or are affected by, the planning and execution of military operations. Factors may include, but are not limited to, environmental compliance, pollution prevention, conservation, protection of historical and cultural sites, and protection of flora and fauna.[11]
Environmental impacts	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.[12]
Environmental mainstreaming	The informed inclusion of relevant environmental concerns into the decisions and institutions that drive national, sectoral, and local development policy, rules, plans, investment and action. Defined by International Institute for Environment and Development 2009
Environmental management	The identification and assignment of clear responsibilities and resources to provide effective and proactive environmental management. Often expressed in terms of due diligence; that is a system for ensuring that all reasonable efforts are made to prevent environmental damage.
Environmental management system (EMS)	Environmental management system refers to the management of an organisation's environmental programs in a comprehensive, systematic, planned and documented manner. An EMS follows a Plan-Do-Check-Act Cycle and strives for constant improvements in environmental performance. The ISO 14001-series deals with environmental management as well as the Eco-Management and Audit Scheme (EMAS) of EU.
Environmental officer	For the purpose of this report the term EO, Environmental Officer is used for the officer with the responsibility to attend to all matters regarding environmental compliance and performance. Other countries use the term EHO, Environmental Health Officer or, even more common, Environmental Engineer.

[11] Department of the Army United States 2010

[12] NATO 2009

Term	Description
Environmental protection	Measures and controls to prevent damage and degradation of the environment, including the sustainability of its living resources.[13] The application of human ingenuity and resources, through the disciplines of science and engineering, as required by environmental protection laws, regulations, and policies, to protect the natural environment. They accomplish this by adding the dimensions of human attitudes and values to the technical environmental protection process.[14]
Environmental security	Environmental security includes the nexus between environment, security and development. In the context of a holistic definition of security, environmental security is a component of national security and hence a component of overall global security. The perception of environmental security varies among scholars and practitioners and no unified definition exist
Environmental stewardship	The integration and application of environmental values into the military mission in order to sustain readiness, improve quality of life, strengthen civil relations, and preserve valuable natural resources. Environmental stewardship represents the reflection of leader and individual awareness of and commitment to protecting the environment. It is a proactive, values based concept that helps to ensure the sustainability and conservation of resources.[15]
Sustainability	The continuation of benefits from a development intervention after major assistance has been completed. It includes the probability of continued long term benefits and resilience to risk over time and includes financial, institutional, human resource, management and other elements.[16]
Sustainable development	A development that meets the needs of the present without compromising the ability of future generations to meet their own needs.[17]

[13] NATO 2009

[14] Department of the Army United States 2010

[15] Department of the Army United States 2010

[16] OECD 2008

[17] UN 1987

Appendix 2 - The respondents in the survey

The respondents in the survey and their positions corresponds to figure 3 and 4 in chapter 6. √ indicate response. NR indicate ”no response”.

Number	Position	Response
1	Civilian Environmental Professional, MoD level	√
2	Civilian Environmental Professional, MoD level	√
3	Active Duty Officer, National Joint Forces HQ level	√
4	Civilian Environmental Professional, MoD level	√
5	Active duty officer, National Joint Forces HQ level	NR
6	Civilian Environmental Professional, other	√
7	Civilian Environmental Professional, MoD level	√
8	Civilian Environmental Professional, other	√
9	Active Duty Officer, Joint Forces HQ level	√
10	Civilian Environmental Professional, MoD level	NR
11	Civilian Environmental Professional, MoD level	√
12	Civilian Environmental Professional, MoD level	√
13	Active duty officer, National Joint Forces HQ level	√
14	Civilian Environmental Professional, national MoD	√
15	Active Duty Officer, Army Engineer	√
16	Civilian Environmental Professional, Multinational Joint HQ level	√
17	Active Duty Officer, Multinational Joint Forces Command level	√
18	Civilian Environmental Professional, Multinational Joint HQ	√
19	Civilian Environmental Professional, Multinational Deployed HQ	√
20	Civilian Environmental Professional, Multinational Joint HQ	√
21	Civilian Environmental Professional, Multinational Joint HQ	√
22	Duty Officer, National Joint Forces HQ level	NR
23	Civilian Environmental Professional, other	NR
24	Active Duty Officer, Army Engineer	NR
25	Active Duty Officer, Multinational Joint Forces Command level	NR

Appendix 3 - The questions of the survey

Table 1. The questions of the survey

Q1	How are environmental policies motivated in the planning and execution of complex peace operations*?
Q2	What difficulties and problems do you see being the primary ones for the ability to integrate environmental considerations into strategic and operational planning?
Q3	Could increased emphasis on the importance of environmental issues for mission success facilitate the integration of environmental considerations into strategic and operational planning?
Q4	What should an ideal organisation look like in order to make sure that environmental considerations are appropriately addressed (as opposed to how it may look today)?
Compl. questions	Your country has ratified all relevant NATO EP STANAGs, does that mean that it is the doctrine you apply in international operations or does your country also have its own environmental policy, doctrine etc? If your country also has a national doctrine does the same policy and doctrine apply for domestic and international operations and activities, and what are the general views and practice when it comes to what doctrine to apply and when (in e.g. joint operations, e.g. ISAF etc)? If your country would deploy or support an EU-led or UN-led field mission, what would your country's action be like then?

* Complex Peace operations in this regard refer to a broad range of military activities including peace support missions (i.e. peace-building, peace-keeping and peace-enforcement) and contingency operations.

Appendix 4 - Environmental policies and other related documentation in nations and multinational organisations

This survey was performed to answer a set of questions:
1. Is there an environmental policy formulated for the defence actor/multinational peace organisation?
2. Are peace operations specifically addressed?
3. Is there other relevant documentation concerning environmental issues?
4. If the country is a NATO member, are the relevant STANAGS ratified?

In the beginning of each section, the relevance of the country/organisation in this study is described.

National policies and strategic documents

Finland

Finland is a close neighbour to Sweden and an important partner for the Swedish defence sector, through the Nordic defence cooperation. In addition, Sweden and Finland have cooperated in several defence-related environmental projects (e.g. the Environmental Guidebook for Military operations[1]). Finland is furthermore an EU member and a UN member and participates actively in peace operations, mainly through non-UN commissioned operations.[2]

Currently the Finnish Defence Forces uses the Finnish MoD's environmental policy, which is on a general level. The guidebook written together with Sweden and USA has the status of a guiding document and is not complying. The Finnish Defence Forces is (as of February 2011) about to publish a new long term environmental protection strategy and normative guidance which includes an environmental policy. The intention of the policy is that during operations Finnish legislation's requirements are to be followed to the extent possible. If the legislation of the host nation is stricter than Finnish legislation, the host nation’s requirements shall be met. If operational goals are in contradiction to environmental goals the least harmful option should be chosen taking the security situation into consideration.

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1 Bosetti *et al.* 2008

2 According to Center on International Cooperation 2010, it was among the top 20 troop contributors to non-UN commissioned peace operations in 2009

The Sustainable Development Programme (SDP) [3] has been developed to implement the Finnish national strategy and mainstream the activities within the organisation when it comes to sustainable development. Peace operations are seen as one means of contributing to sustainable development. The SDP states that since developing and using of defence capabilities have major environmental, economical and social impacts on national and regional level; the defence administration has a responsibility for personnel, economy, natural resources and cultural heritage. Some of the objectives are development of impact assessment and to improve the awareness among the personnel concerning sustainable development. Also, enhancement of sustainable development in military crisis management is a focus area, where tasks are to be implemented by taking account of local conditions and the nature of the task in an ecologically, economically, socially and culturally sustainable way. The programme is said to evolve through implementation, reporting, evaluation and the development of indicators.

The Ministry of Defence Strategy 2025 "Securely into the future"[4] is an assessment of the long-term development in the Finnish security environment. The strategy describes the future challenges facing defence policy and military defence and identifies, among other things, natural resources and other environmental factors as security challenges in the future. As a result, Defence Forces should prepare to support other authorities in environmental disaster consequence management. Moreover, it is stressed that the Ministry of Defence and the Defence Forces must take environmental protection issues into consideration in all activities and to further develop its capacity for environmental disaster prevention.

Norway

Norway is one of the selected countries, for the same reasons as Finland as it is a close neighbour to Sweden and part of the Nordic defence cooperation. It is a member of NATO and UN and participates actively in peace operations[5] although mainly through non-UN commissioned operations. Norway is also a contributor to NBG, Nordic Battlegroup[6], although not a member of EU. Its current largest troop contribution is to ISAF. Norway has ratified the relevant environmental NATO STANAGs and incorporated them in its national policy.

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[3] Heikkilä 2010

[4] Ministry of Defence Finland 2006

[5] According to Center on International Cooperation 2010, it was among the top 20 troop contributors to non-UN commissioned peace operations in 2009

[6] NBG is one of EUs two battle groups constantly on standby. The countries contributing to NBG is Estonia, Finland, Ireland, Norway and Sweden.

In 2010 guidelines for environmental protection activities for the Defence sector became operative.[7] It is stated that environmental considerations should be an integral part of all decision at al levels. The Norwegian Defence has four major tasks when it comes to environmental protection; to fulfil environmental regulations, to prevent environmental damage, to reduce existing environmental damage, and to give environmental related assistance to the civil society.

Regarding peace operations, the Norwegian participation shall to the extent possible not negatively impact local environmental and natural resources. The same considerations shall be shown as for domestic activities. The guiding principle is to comply with the Norwegian environmental legislation or regulations, also in peace operations which are not defined but presumed to mean international protocols and conventions. There is an insight that this might be difficult, as in many respects it is controlled through the host nation's infrastructure – e.g. waste management. If there is a difference in regulations between the Norwegian and the local, the strictest shall apply, as long as it is consistent with the operational needs and circumstances.

As of 2010, Norway did not have any specific environmental future outlook study.[8]

Denmark

Like Norway, Denmark is a neighbour to Sweden and a member of NATO, however, not as closely tied to the Nordic defence cooperation as Finland and Norway. Denmark is also a member of EU as well as UN and participates actively in peace operations[9] mainly through non-UN commissioned operations.[10] Its current largest troop contribution is to ISAF. Denmark has ratified the most relevant environmental NATO STANAGs and incorporated them in its national policy.

The Danish Defence states that the environmental performance should be dynamic, leading to resource-efficient use of "greener" technology.[11] The Danish Defence shall act to prevent pollution, decrease the use of resources and raise the environmental awareness within the organisation. Environmental management is

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7 Ministry of Defence Norway 2009

8 NATO/SPS 2010

9 According to Center on International Cooperation 2010, it was among the top 20 troop contributors to non-UN commissioned peace operations in 2009

10 According to Center on International Cooperation 2010, it was among the top 20 troop contributors to non-UN commissioned peace operations in 2009

11 The Defence Command Denmark states on their website URL <http://forsvaret.dk/FKO/Om%20Forsvaret/Mission%20Vision%20Strategier/Pages/miljoepolitik.aspx> a number of goals regarding environmental considerations, such as reduced energy consumption and air emissions, to mention a few

applied to aid in these efforts, e.g. through environmental action plans and an environmental handbook.

In the defence regulation for energy and environment [12] environmental considerations and local circumstances in international operations are specially highlighted with references to for instance STANAG 7141. The regulation states that Danish national requirements shall be met as far as the operational goals allows. Camp sites for instance shall be run with the highest possible environmental stewardship and that harmful activities shall be avoided or reduced as far as practically reasonably.

Canada

Canada is interesting for this study for a number of reasons. Canada and Sweden has over the years had extended defence research cooperation on environmental issues and environmental health. [13] The two countries have over the years also served in peace operations together such as in Bosnia and Herzegovina (SFOR) and the Middle East (UNIFIL). Canada is a UN and NATO member. It participates actively in peace operations[14] mainly through non-UN commissioned operations.[15] Canada is furthermore active in the NATO environmental community. Canada has ratified most relevant environmental NATO STANAGs.

The overall existing document regarding environmental issues is the directive on Environmental Protection and Stewardship.[16] It states among other things that the Canadian Forces (CF) are accountable for the impact their activities may have on the environment and states a code of environmental stewardship to be adopted with reference to national legislations and regulations[17].

[12] Forsvarets Bygnings- och Etablissementstjenste Denmark 2010

[13] Sweden has signed a Memorandum of Understanding with the Netherlands and Canada regarding cooperation in defence related projects. Two project arrangements (PA) concerning environmental and health issues have been signed during 2000-2010; "EIHH – Environmental and Industrial Health Hazards" and "Environmental aspects of energetic materials", - the latter still running. During 2011 a new PA are planned regarding "Environmental Impact Assessments in naval operations".

[14] According to Center on International Cooperation 2010, it was among the top 20 troop contributors to non-UN commissioned peace operations in 2009

[15] According to Center on International Cooperation 2010, it was among the top 20 troop contributors to non-UN commissioned peace operations in 2009

[16] Canadian National Defense 1999

[17] The national legislations and regulations referred to are: The Canadian Environment Protection Act 1999 and The Canadian Environment Assessment Act and Regulations.

In the Deputy Chief of Defence Staff's Direction for International Operations (DDIO) [18] an environmental policy for deployed armed forces activities is presented. The policy states that commanders at all levels are required to; integrate environmental considerations in decision-making, improve levels of environmental awareness and practice pollution prevention in day-to-day activities. The importance of performing an Environmental Baseline Study (EBS) is specifically highlighted. The Policy on Environmental Protection and Stewardship states that "DND[19] and the CF are accountable for the impact that defence activities have on the environment. The intent of this policy is to ensure DND employees and CF members respect the environment, exercise environmental stewardship, and protect public and non-public properties and assets held in trust."

The National Defence Sustainable Strategy on Environmentally Sustainable Defence Activities[20] addresses issues such as climate change, green house gas emissions, ecosystems and pollution prevention. It also presents an Action Plan with 16 Strategic Commitments and Monitoring Commitments regarding water treatment, solid waste and spills. During 2011 this document is to be replaced by the Defense Environmental Strategy (DES).

Canada is one of the nations that were identified to have an environmental future outlook study.[21]

Germany

Germany is interesting for a number of reasons. It is an EU, UN, as well as a NATO member. In addition, it participates actively in peace operations[22] mainly through non-UN commissioned operations.[23] It has also an ambitious approach and has ratified most relevant environmental NATO STANAGs.

The Germany Defence Policy Guidelines[24] briefly mentions environmental issues in a paragraph stating that the German policy is comprehensive and takes among other ecological conditions and developments into account. The Policy Directive on Environmental Protection in the Bundeswehr[25] states however that members

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[18] Canadian Forces 2000. The DDIO is to be replaced by a Canadian Expeditionary Force Command Directives for International Operations (CDIO) and is under revision. The directive on Environmental Protection will be published in 2011.

[19] Department of National Defence

[20] Canadian National Defence 2006

[21] NATO/SPS 2010

[22] According to Center on International Cooperation 2010, it was among the top 20 troop contributors to non-UN commissioned peace operations in 2009

[23] According to Center on International Cooperation 2010, it was among the largest troop contributors to non-UN commissioned peace operations in 2009

[24] Ministry of Defence Germany 2003

[25] Ministry of Defence Germany 2007

of the armed forces are "required to comply with environmental standards even during mission abroad". There is also stated that host nations environmental laws should be observed if it stipulates higher standards than German law.

Germany is one of the nations that were identified to have an environmental future outlook study.[26]

United Kingdom

United Kingdom is an EU, UN, as well as a NATO member. In addition, it participates actively in peace operations[27] mainly through non-UN commissioned operations.[28] It has ratified the relevant environmental NATO STANAGs.

A Policy Statement by the Secretary of the State for Defence was updated and signed in September 2010. This document describes in high-level terms the system for managing environmental protection within the MOD[29] and requires that "where reasonable practicable" UK standards shall be applied over seas.

The MOD Sustainable Development and Environment Manual[30] supports a framework for environmental protection in the MOD, at an operational level and includes issues like Environment Management Systems, environmental protection and management in acquisition, visiting forces in the UK etc. The manual addresses operational theatres and recognises the importance of addressing and identifying environmental issues already in the planning process. UK forces must under all conditions strive to respect environmental protection principles and policies. It is suggested that "the most significant environmental gains may be achieved during the planning phase" when there is a possibility to in detail consider different options from an environmental point of view in e.g. in the choice of materials etc.

The different stages or maturity of an operation are discussed in terms of what can be done in which phase. It is argued that environmental risks in the initial phase of the operation often are associated with "common sense" and good camp hygiene such as selecting suitable locations for re-fuelling and taking proper field hygiene measures. As the operations mature and develops there are new opportunities to reduce the environmental footprint. Force awareness regarding environ-

[26] NATO/SPS 2010

[27] According to Center on International Cooperation 2010, it was among the top 20 troop contributors to non-UN commissioned peace operations in 2009

[28] According to Center on International Cooperation 2010, it was the second largest contributor to non-UN commissioned peace operations in 2009

[29] Ministry of Defence United Kingdom 2009

[30] Ministry of Defence United Kingdom 2005

mental issues and sensitivities[31] associated with the theatre of operations is stressed and it is considered important that these are included in instructions or directives. The responsibility lies with the Commander to make decisions when to promote and increase environmental protection in a unit and Annex C in the MoD manual states mitigating measures for operational environmental aspects at unit level. In the theatre the responsibility lays with the theatre commander, advised by the Chief Environmental and Safety Officer (CESO). [32]

The UK Ministry of Defence Global Strategic Trends[33] explores the relevance of global trends to defence & security out to 2040 and addresses key drivers for change that will affect life on earth - climate change and globalisation.

United States

The United States is interesting for this study for many reasons. It has more troops deployed in overseas operations than any other nation and also has a long tradition of developing environmental policies and doctrine for its domestic as well as its overseas operations. This includes those nations where the United States has bilateral agreements to deploy military bases, such as Germany or South Korea and also for contingency operations. Furthermore, United States is a UN and a NATO member. Sweden and United States have a long going bilateral defence environmental collaboration.

Although a major financial contributor to UN peacekeeping[34], the US primarily operates through non-UN commissioned operations[35] and the situation regarding contingency operations differs somewhat even in the environmental domain. Interestingly, the US has ratified very few of the relevant NATO environmental STANAGs. US environmental practices develop during each particular operation and depend on factors such as duration, threat, and fiscal and manpower resources.

Within the United States with few exemptions the Department of Defence (DoD) is fully subject to US environmental law and regulation and not surprisingly,

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[31] With *sensitivities*, the following is referred to; vulnerability aquifers, dependency of groundwater, endangered species, primitive waste management etc. This is similar to what the Swedish Armed Forces addresses in pre-deployment MEDINT-reports in the Environmental Vulnerability Assessment-part.

[32] Ministry of Defence United Kingdom 2005

[33] Ministry of Defence United Kingdom 2010

[34] According to Center on International Cooperation 2010, it was the single largest financial contributor as well as the single largest troop contributor to non-UN commissioned peace operations in 2009. The latter figure does not include US unilateral and/or coalition non UNSC mandated interventions.

[35] According to Center on International Cooperation 2010, it was the largest troop contributors to non-UN commissioned peace operations in 2009

current policy and guidance reflects that requirement. For contingency operations outside the United States DoD is subject to only to applicable international treaties (Geneva, Hague), and specific agreements (e.g Dayton Accord) as well as any applicable stationing agreements such as status of forces agreement. However over the last 20 years a considerable body of doctrine and guidance has been developed to aid commanders in developing informed, risk-based operational guidance (OPLANs) in the environmental area.

One key document is the Overseas Environmental Baseline Guidance Document (OEBGD)[36]. The OEBGD provides criteria, standards, and management practices for environmental compliance in foreign countries with "permanent" US DoD installations. It applies to all US DoD Components[37] but exempts off-installation operational deployments, contingency operation in hazardous areas and joint operations with other nations if the US is not lead nation.[38] This means that while the OEBGD is not applicable to military operations it may be valuable in developing the environmental annex of specific Operations Plans (OPLANs). For its Army and Marine Corps operations, the US has recently updated its field manual on Environmental considerations.[39] The manual provides guidance on integrating environmental considerations into the conduct of operations. It defines such environmental considerations and provides guidance on their integration into the operations process. The manual also provides guidance on the development of command environmental programs and standing operating procedures (SOPs) to support operations and training. Similarly, the Air Force has an Environmental Handbook for Contingency Operations Overseas.[40] In addition, the joint engineering operations publication contains a chapter on environmental considerations applicable to operations.[41]

The DoD publication "Military support to Stability, Security, Transition and Reconstruction" has been judged[42] to also be highly relevant to contingency operations, although it does not address environmental considerations.

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[36] Department of Defense United States 2007. The document was issued in 2007 under the authority and requirements of DoD Instruction (DoDI) 4715.5, "Management of Environmental Compliance at Overseas Installations," April 22, 1996. It replaced the previous document from 2000.

[37] With DoD component is meant: the Office of the Secretary of Defense, the Military Departments, the Chairman of the Joint Chiefs of Staff, the Combatant Commands, the Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organisational entities within the Department of Defense.

[38] Mosher *et al.* 2008

[39] Department of the Army United States 2010 (this field manual replaced the FM 3_100.4 from 2000)

[40] The US Air Force Handbook 2007

[41] Joint Staff United States 2007

[42] Mosher *et al.* 2008

Regarding climate change, Executive Order 13514 from the White House[43] is the entry point. The order stipulates that reduction of GHG is a priority of all federal agencies, including DoD. The document is applicable at overseas permanent bases but it is not clear if it would apply to military operations.

The United States is one of the nations that were identified to have an environmental future outlook study.[44]

Netherlands

The Netherlands is an EU and UN member as well as a NATO member. Netherlands also participates actively in peace operations[45], although primarily through non-UN commissioned operations[46], such as ISAF. Furthermore, Sweden and Netherlands are involved in trilateral defence environmental collaborations.[47] The Netherlands is actively engaged in the NATO environmental community.

The capstone environmental document for the Netherlands defence is the Defence Environmental Policy Memorandum from 2008.[48] Environmental policy and doctrine for Netherlands overseas engagement in peace operations is in compliance with the NATO counterpart. Most of the relevant NATO environmental STANAGs are ratified.

The Netherlands has also developed an environmental future outlook study that addresses the consequences of environmental change for the Netherlands Ministry of Defence in the time span 2007-2030 and is furthermore co-directors for a NATO SPS project addressing environmental future outlook studies in the wider NATO/PfP community.[49]

Belgium

Belgium is an EU and a UN member as well as a NATO member. In addition, it participates actively in peace operations[50] and has currently operations ongoing

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[43] The White House 2009

[44] NATO/SPS 2010

[45] According to Center on International Cooperation 2010, it was among the top 20 financial contributors to UN peacekeeping operations as well as a top 20 troop contributor to non-UN commissioned peace operations in 2009.

[46] According to Center on International Cooperation 2010, it was among the top 20 troop contributors to non-UN commissioned peace operations in 2009.

[47] For instance *Environmental effects of energetic materials* and *Environmental impact of naval operations* together with Canada

[48] Ministry of Defence The Netherlands 2008

[49] Ministry of Defence The Netherlands 2007; NATO/SPS 2010

[50] According to Center on International Cooperation 2010, it was among the top 20 financial contributors to non-UN commissioned peace operations in 2009

in both NATO-led (ISAF) and UN-led (UNIFIL) peace operations. Belgium is furthermore active in the NATO environmental community

Belgium has developed an environmental policy[51] in accordance with the NATO policy. The Belgian policy is however applicable for Belgian participation in all kind of peace operations (EU, UN, and NATO). In addition it has published SOP "Environmental Management in Operations Abroad"[52]; where the relevant NATO STANAGs have been translated and annexed to the document. For training activities Belgium is developing yet another document also relying on the NATO policy. Belgium has furthermore ratified most of the relevant NATO environmental STANAGs.

As of 2010, Belgium did not have any specific environmental future outlook study.[53]

Multinational organisations

United Nations

UN has been engaged in peacekeeping since 1948 and has since launched 64 peace operations. Currently the Department of Peacekeeping Operations (DPKO)[54] have over 122,000 military, civilian and police deployed in 15 peace operations worldwide.[55] The five largest troop contributing nations in 2009 were Pakistan, Bangladesh, India, Nigeria, Egypt and Rwanda. The only European or North-American countries that were among the top 20 largest troop contributors were Italy and France.

The main body in the UN system that addresses environmental issues is UNEP. UNDPKO/DFS has therefore engaged in a partnership where UNEP and partners provide environmental support to UN peacekeeping. UNEP also supports the UN Peace building Commission with expertise in the area of natural resources and its connection to conflict as well as peace building.

In June 2009, the United Nations Department of Peacekeeping Operations and Department of Field Support (UN DPKO/DFS) promulgated its first environ-

[51] Armed Forces Belgium 2005

[52] Armed Forces Belgium 2010

[53] NATO/SPS 2010

[54] January 2011. In additions there are also DPA (Department of Political Affairs) and DFS mandated missions, see http://www.un.org/en/peacekeeping/documents/dfs_mission_supprt_map.pdf

[55] The current UN deployments are found at http://www.un.org/en/peacekeeping/operations/current.shtml

mental policy.[56] In addition environmental guidelines have been drafted.[57] The policy applies to the military and police components as well as the civilian components of a UN field mission and places environmental responsibilities throughout the chain of command. It addresses. The policy cover thematic areas such as solid and hazardous waste management, water, waste water, hazardous substances, wild animals and plants, cultural and historical resources management and energy. It also discusses cross cutting areas such as the role of the environmental officer, the need for environmental assessments and an EMS for addressing major environmental issues. Furthermore, it states that the resources needed for implementing the police should be included in budget of each mission. Environmental focal points have been appointed in all missions and some missions have developed own policies and started to implement them.

At the highest echelon level of UN peacekeeping doctrine[58] the environment is also mentioned, although indirectly, when stating that "lax waste management practices are just some of the negative impacts that may seriously undermine the perceived legitimacy and credibility of a mission, and erode its popular support."

There are a wealth of initiatives within the UN system related to environment and peacekeeping one way or the other, three of them include;

- The Secretary General High-level Panel report on Threats, Challenges and Change from 2004 that acknowledged environmental degradation as one of six clusters of threat that the world need to be concerned about.[59]
- A forthcoming report from UNEP and partners addressing the role of UN Peacekeeping operations in Natural resources management and environmental considerations.[60]
- A Greenhouse Gas Inventory of all DPKO and DPA (Department of Political Affairs) led missions in order to produce a GHG emission reduction plan.[61]

European Union

The European Union is a relatively new actor in the area of peace operations but has nevertheless launched several major peace operations the last few years such

[56] UN DPKO 2009a

[57] UN DPKO 2009b

[58] UN 2008a

[59] UN 2004

[60] UNEP 2011

[61] This is performed within the overall context of moving towards a climate-neutral UN. In October 2007 CEB decision required undertaking a Greenhouse gas (GHG) emissions inventory for each UN organisation by the end of 2009.

as EUFOR ALTHEA in Bosnia and Herzegovina, EUFOR Chad/RCA (Central African Republic) and EUNAVFOR in the Horn of Africa. [62]

At the strategic military EU level, environmental protection policies and guidelines are currently absent. There are however some environmental provisions embedded in e.g. the military engineering concept[63] and the medical concepts[64]. Furthermore, work that aims at developing an environmental concept for EU-led military operations has been initiated.[65]

Despite the absence of an overarching policy document, individual EU-led peace operations do have the facility for embedding policies relating to environmental protection. For instance, in EUFOR Operation ALTHEA the environmental officer has developed a comprehensive and useful environmental package consisting of an Environmental Protection Policy, an EMS policy and an SOP for Environmental Status Assessment.[66]

Furthermore, regardless of the current vacuum with respect to environmental policy for EU-led military and crises management operations, the EU is active in the environmental department. For instance, there is a wide recognition within EU that environmental stress can be one contributing cause of conflict or tension.[67] The re-enforced European Security Strategy[68] also further develops the idea of climate change and scarce water resources in relation to future conflicts. In addition, the EU and the UN has recently established a partnership on natural resources, conflict and peace building, financed by EUs Instrument for Stability.[69]

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62 For information on current as well as terminated EDSP missions see for instance URL <http://www.consilium.europa.eu/showPage.aspx?id=268&lang=en>

63 Council of The European Union 2007a

64 Council of The European Union 2007b

65 Council of The European Union 2010. The concept will draw upon, among other sources, the Environmental Guidebook developed by Finland, Sweden and the United States (Bosetti *et al.* 2008)

66 EUFOR 2005

67 See: Pérez 2004

68 European Council 2003

69 For more information see for instance URL <http://www.unep.org/conflictsanddisasters/Policy/EnvironmentalCooperationforPeacebuilding/UNEUPartnership/tabid/29405/Default.aspx>

NATO (North Atlantic Treaty Organization)

The North Atlantic Treaty Organization (NATO) is engaged in peace operations in Kosovo (Kosovo Force; KFOR), Afghanistan (International Security Assistance Force, ISAF), counter piracy off the Horn of Africa (Operation Ocean Shield), Iraq (NATO Training Mission-Iraq; NTM-I) and is supporting the African Union in Somalia. It has previously also been engaged in Bosnia and Herzegovina, Macedonia and in disaster and relief operations in Pakistan. It had close to 140,000 troops and civilians deployed at the end of 2010.[70]

NATO has had programmes addressing environmental issues since 1969. In 1999 a pilot study on environmental security[71] was presented and in 2003 a similar study on EMS in the military sector[72] was launched. In 2003 it also published its first Environmental Policy for NATO-led military activities[73]. This constituted for the first time an external demand and pressure on troop contributing countries to address environmental issues in NATO-led military operations, the caveat being that these measures must be consistent with operational requirements.[74] The policy defines the responsibilities of NATO commanders as well as commanders from sending nations. Environmental considerations should be taken into consideration as early as possible in the planning and execution and the operations plan should, where appropriate include specific environmental guidance in the form of an environmental protection annex. NATO and sending nations have a collective responsibility protecting the environment but each nation is ultimately responsible for the action of its forces. The policy is mandatory to all NATO and non NATO participants during operations and exercises, which probably explains why it is generic, i.e. contains no thematic topics like the UN equivalent policy does, and in addition is rather toothless, with several caveats regarding what is “reasonable practicable”, “where appropriate” etc.

The environmental policy and an environmental protection doctrine frame the environmental protection requirements. The doctrine[75], states environmental planning guidelines that include an environmental risk management framework,

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[70] For information on current as well as terminated NATO missions see for instance URL <http://www.nato.int/cps/en/natolive/topics_52060.htm>

[71] Lietzmann and Vest 1999

[72] NATO 2003b

[73] NATO 2003a

[74] The Policy is at the moment (spring 2011) under revision and the phrasing is expected to be somewhat different, with a stronger emphasis on environmental considerations and mission success

[75] NATO 2008

states the environmental responsibilities of the commander and discusses in some detail environmental training and awareness.

There are also procedures in the form of standardisation agreements[76] (STANAGs) addressing for example waste management, petroleum handling and field sanitation in more detail.[77] This reflects the fact that solid and liquid waste as well as oil spills traditionally has been the most visible environmental impacts from military operations as well as a major and costly problem. In addition, field sanitation is important for force health protection as well as for environmental protection. Furthermore, NATO has drafted[78] Allied Joint Publication Environmental Best Practices[79], Standards and Norms[80] and EMS Guidelines.[81] These documents serves as the basis for developing environmental annex to the operation plans (OPLAN) for individual operations. Individual missions such as ISAF also have SOPs addressing Environmental Protection.

In addition, so-called "NATO Guidelines on the Acquisition of Environmentally Sound Defence materials" have been drawn up. These guidelines state that in the context of procuring materiel and services, environmental aspects are to be an equally important factor as effectiveness, quality and life-cycle costs.[82]

At the operational and tactical level in NATO environmental consideration is an engineer responsibility. However, at the very strategic level an increased awareness for the environment, which for instance is reflected in the new NATO strategic concept[83] acknowledges that; "*Key environmental and resource constraints, including health risks, climate change, water scarcity and increasing energy needs will further shape the future security environment in areas of concern to NATO and have the potential to significantly affect NATO planning and operations*."

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[76] The fact that the doctrine is expressed as a standardisation agreement (STANAG) might seem confusing.

[77] NATO 2009a; NATO 2009e; and NATO 2004

[78] These documents have entered the NATO standardisation process and will be promulgated when a majority of NATO member states has ratified them.

[79] NATO 2009c

[80] NATO 2009b

[81] NATO 2009d

[82] NATO 2001

[83] Para 15 in: "Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organisation" Adopted by Heads of State and Government in Lisbon. November 2010. Available at URL <http://www.nato.int/lisbon2010/strategic-concept-2010-eng.pdf>