

## Executive Summary Report Preface

In 1969, the North Atlantic Treaty Organisation (NATO) established the Committee on the Challenges of Modern Society (CCMS) as a unique forum for co-operation on issues of inter alia transboundary environmental protection and environmental problems in general. Through the CCMS framework, Member States conduct pilot studies and projects on a wide range of topics such as transboundary air and water pollution, marine oil pollution, and environmental problems stemming from the use of modern technology.

NATO, its Member States, and other security organisations are increasingly concerned with non-traditional threats to security, including the consequences of environmental change. The Pilot Study entitled "Environment and Security in an International Context" was launched within the framework of NATO/CCMS on the occasion of the NATO/CCMS Plenary Meeting in Washington, DC on 14 November 1995. This report summarises the relationship between environmental change and security at the regional, international and global levels.

The Pilot Study is co-chaired by Germany and the United States. Its main goal is to elaborate conclusions and recommendations to integrate environmental considerations in security deliberations and to integrate security considerations in national and international environmental policies and instruments. These conclusions and recommendations are guided by the principles of sustainable development and a precautionary approach, emphasising preventive measures and strategies. They will ultimately

provide a basis for senior-level decision-making. To support the development of these conclusions and recommendations, the Pilot Study developed methodologies and approaches for analysing the relationship of environmental change and security and prioritising its key elements. The Pilot Study has evolved as a truly unique opportunity for the exchange of information and views from a wide range of experts in the scientific and policy communities. The interdisciplinary nature of the Pilot Study has provided a multilateral forum for co-operation, exchange and dialogue among the environmental, development, foreign and security policy communities. The completion of the Pilot Study through a consensus-based process offers the opportunity to continue and expand the spirit of co-operation developed over the course of our work.

The Pilot Study was made possible by the active co-operation of experts from government, academia, private industry and non-governmental organisations (NGO) from the member countries of the NATO Alliance and Euro-Atlantic Partnership Council (EAPC). In addition, experts from other international and regional organisations played a valuable role in providing input on the conclusions and recommendations developed in the Pilot Study. Most importantly, we would like to acknowledge and thank all those who participated in the Pilot Study. We especially would like to commend and recognise all of those responsible parties who provided not only their expertise through actively engaging in research and the delivery of papers and presentations, but also those who contributed their organisational support and planning

assistance in making the Pilot Study plenary meetings and subgroup workshops a success.

Overall, we hope that the Pilot Study's Executive Summary Report and Full Technical Report provide a unique and lasting contribution to the recognition, analysis and response to the

relationship between environmental change and security and the impetus for effective co-operation, preventive action and response by institutions at the international, regional and national level.

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## Overview of Environment and Security

Since the end of the Cold War, traditional security concepts based on national sovereignty and territorial security have increasingly been brought under scrutiny. Instead, a broader definition of security that would incorporate non-traditional threats to security and their underlying causes such as economic decline; social and political instability; ethnic rivalries and territorial disputes; international terrorism; money laundering and drug trafficking; and environmental stress is being advocated. In particular, the relationship between the environment and security has been of increasing importance in recent years in both the scientific and policy communities.

The relationship between environment and security is addressed in a number of research efforts.<sup>1</sup> Several of these research efforts aim to 'redefine' or broaden the concept of security to include social, economic and environmental factors. In contrast to the classical narrow concept of security, the broader concept proceeds from a differentiation of levels of analysis (individual, national, regional and international security).

Other projects approach the debate by making distinctions among the factors which affect security. More conceptual, they address the conditions under which global change and environmental degradation lead to violent conflict. They attempt to establish a

causal relationship between environmental factors and conflict through case study based research projects.<sup>2</sup> Researchers are also attempting to derive conclusions about the importance of environmental stress to the incidence of conflict.<sup>3</sup> Additionally there is research focusing on the human dimension and its role in environmental change and security as well as the role of climate change and its socio-economic impacts on violent conflict.<sup>4</sup> Our Pilot Study builds upon this research.

The growing global concern for the environment over the last 30 years culminated in the United Nations Conference on Environment and Development in Rio de Janeiro in 1992 which made a major contribution to the recognition of environmental issues in the international arena. At this watershed conference, the principle of 'sustainable development' was first endorsed by the global community. There was a general acceptance of the idea that environmental, economic and social issues are interdependent and cannot be pursued separately. Since then the principle of sustainable development has become an important guideline for action in the field of environmental, economic and development policy. Moreover, due to the increasing discussion and research about the potential for large-scale environmental changes and the general acknowledgement of the relationship between environmental change and human society (social, economic and demographic issues), there has been more attention paid to the question of the relationship between environment and security.

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<sup>1</sup> *The environment and security debate in policy and academic arenas has been fostered by the publications of Lester Brown, Thomas Homer Dixon, Richard Ullman, Jessica Matthews, Norman Myers and Robert Kaplan.*

<sup>2</sup> *These include the following research projects: the Project on Environment, Population and Security, conducted by Thomas Homer-Dixon of the Peace and Conflict Studies Program of the University of Toronto; the American Association for the Advancement of Science and the Environmental Conflicts Project (ENCOP) lead by Günther Baechler of the Swiss Peace Foundation and Thomas Spillmann of the Swiss Technical University .*

<sup>3</sup> *Several projects, for example the International Peace Research Institute-Oslo (PRIO) under the head of Nils Petter Gleditsch, use quantitative methods to look for correlation between different types of environmental degradation and conflict.*

<sup>4</sup> *The Global Environmental Change and Human Security Project (GECHS) of the International Human Dimensions Programme, University of Victoria, Canada under the Chair, Steve Lonergan and the Dutch National Research Programme on Global Air Pollution and Climate Change.*

The degree to which environmental stress actually contributes to the incidence and escalation of conflict depends on the relationship between the consequences of environmental stress and on a number of socio-economic, political and other contextual factors. Environmental problems can have a serious and long lasting negative influence on peoples' living conditions and can lead to economic and social problems such as poverty, food insecurity, poor health conditions, and migration, within as well as between countries.<sup>5</sup> Even so they seldom directly cause or trigger crisis and conflict. Political and economic stability and capacities, cultural and ethnic factors, or the existence of non-violent mechanisms of conflict resolution have a large impact on how environmental stress is dealt with by individuals and political stakeholders. If these contextual factors are unfavourable, the incidence of conflict due to the consequences of environmental stress is likely. If the contextual factors are favourable, the probability of a peaceful solution is improved.

As these environmental challenges continue, their impact on the potential incidence or escalation of tension and conflict are becoming a key concern for policy makers. However up to now - despite the recognition of the sustainability principle - the potentially unfavourable effects of unsustainable action, environmental degradation and resource scarcity have not gained the necessary recognition by political actors at the various levels.

For example, the consequences of global climate change have effects at the regional and local level in areas such as small island states, coastal zones and low-lying countries, and drought stricken regions. In this case, standards of economic growth, rising standards of living in the developing world and high living standards in industrialised countries contribute to global environmental problems such as climate change. The trans-boundary effect of these changes exceeds the capabilities of individual nations to deal with them in a comprehensive manner. Furthermore, the more indirect relationship between causes and effects and between

those who caused and those who suffer from environmental change and its effects also impedes political action. Political action at the international level is crucial in order to deal with the issue of environment and security.

Research has indicated that global environmental change and its socio-economic effects are likely to intensify in the future. The intensity as well as the interdependence of these problems will have effects on an international scale and also begin to impact industrialised countries more directly. Therefore, these challenges call for an enhanced co-operative action at the international level, integrating actors from different policy areas including environmental, development, foreign and security policy.

### *Origins and Working Programme of the Pilot Study*

Despite lacking scientific consensus on the interlinkages between environmental change and security, NATO/CCMS took up the subject during the Washington DC, NATO/CCMS Round-Table in November 1995. The participants agreed that it would be useful to summarise the existing knowledge on the links between environment and security and to develop appropriate policy approaches for preventive action. It highlighted that man-made environmental degradation, resource depletion and natural disasters may have direct implications for the security of the international community and that a comprehensive threat assessment, a risk analysis, as well as a prioritisation of risks to international security was needed to address these challenges. The Pilot Study "Environment and Security in an International Context" which was initiated at this meeting, should address these tasks.

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<sup>5</sup> Several examples include the civil wars in Rwanda and Sudan, the escalation of the domestic political crisis in Nigeria, domestic and transboundary tensions on the Indian subcontinent, or conflicts about the distribution of water in the Middle East. In these examples, the inter-linkages between environmental stress and conflict have played an important component in the conflict dynamic.

At an early stage of the study, participants identified several gaps in the existing knowledge base on the relationship between environment and security which should be addressed primarily in the analysis. First there were basic methodological and conceptual issues of approaching the relationship between environment and security. Secondly there were questions of data availability and a lack of generally accepted indicators of environment and security as a base for decision-making. Finally, there were policy-orientated issues concerning threat assessment of environmental problems and the development of policy responses.

To prepare for a Pilot Study and to develop a proposal for its terms of reference to be submitted to CCMS, the German Federal Ministry for Environment, Nature Conservation and Nuclear Safety hosted the initial workshop in Aachen, Germany in January 1996. In March 1996 the CCMS adopted the terms of reference for the study developed in Aachen and appointed Mr. Kurt M. Lietzmann (German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety) and Mr. Gary D. Vest (Principal Assistant, Deputy Under Secretary of Defense (Environmental Security), USDoD) as Pilot Study Co-Directors. The study was then opened to participants from partner countries. As a first step in the working schedule, representatives from the Alliance and EAPC countries attended the first Plenary Meeting in Waldbröl in April 1996, hosted by the Federal Armed Forces Office for Studies and Exercises (FAFORSE), Germany, and co-chaired by the Pilot Study Directors. At this first Pilot Study Plenary Meeting, the mandate to elaborate an outline for the Pilot Study (including the overall methodology and terms of reference) was developed. At the same time and throughout the whole Pilot Study, the NATO/CCMS National Co-ordinators and Secretaries were frequently informed and updated as to the progress of the study.

The second Pilot Study Plenary Meeting took place in Ankara, Turkey in November 1996 and was hosted by the Scientific and Technical Research Council of Turkey (TÜBİTAK). Before this Plenary Meeting, Ecologic and

Evidence Based Research (EBR) prepared an Interim Report entitled "Environment and Security in an International Context: State of the Art and Perspectives," describing the conceptual framework for the future framework of the Pilot Study.<sup>6</sup> During this second Plenary Meeting, this Interim Report was presented and accepted. Based on the Interim Report, the outline of the Pilot Study was adopted and three subgroups which reflect the structure of the study, were established. The three subgroups of the Pilot Study were structured according to topic areas and conducted under the leadership of a subgroup chair. The subgroups are as follows:

- Subgroup 1:

"Definition and Modelling" dealt in particular with the development of a concept for the issues of environment and security. The overall aim of Subgroup 1 was to clarify the non-linear relationship between environmental stress, the consequences of environmental stress, contextual factors, and security as well as to develop a typology of cases.

- Subgroup 2:

"Definition and Development of a Database and a Decision Support System," looked at providing decision support for policy-makers by compiling relevant data on environment and security which can serve as a knowledge base for policy making. Subgroup 2 also compiled information on developing environmental indicators to be integrated into early warning systems.

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<sup>6</sup> Information on the Pilot Study Interim Report was also referred in the Spring 1997 edition of the Woodrow Wilson Center's *Environmental Change and Security Project Report, Issue 3*.

- Subgroup 3: "Policy Responses," examined the potential contribution to the incidence or escalation of conflict from different environmental stresses and identified in different geographic regions of importance which may be at risk and developed preventive and remedial policy responses in the areas of environmental, development, foreign, and security policy.

## *Pilot Study Proceedings*

During Subgroup Workshops, papers were provided by both participants and external experts as a contribution to the Pilot Study. The first Subgroup 1 meeting was held in Washington DC in January 1997 hosted by Gary Vest and Dr. Brian Shaw (Center for Environmental Security, Pacific Northwest National Laboratory), where the working plan for this subgroup was developed.

All three subgroups met at a third Plenary Meeting held in Carlisle, USA in May 1997, which was hosted by Mr. Gary Vest, Dr. Kent Butts (Center for Strategic Studies, US Army War College), Dr. Brian Shaw (Center for Environmental Security, Pacific Northwest National Laboratory) and co-chaired by the Pilot Study Directors. The purpose of the meeting was to review the working results of the subgroups, approve a structure for the final report of the study, and develop the schedule for continuing work on the Pilot Study. On this basis, the following expert meetings were held to further discuss the topics areas of each subgroups.

From 16-17 October 1997, a workshop for Subgroup 2 entitled "Definition and Development of a Database and a Decision Support System" was hosted by Mr. Petr Kozel (Ministry of Defence of the Czech Republic) in Prague, Czech Republic and directed by Professor Dr. Bedrich Moldan (Director of the Environmental Center, Charles University, Prague). This workshop focussed on the discussion of indicators for environment and security as well as databases and decision support systems.

In Warsaw on 20-22 October 1997, a workshop for Subgroup 1 entitled "Security Implications on Environmental Issues" dealing with the analytical relationship between environment and security was hosted and directed jointly by Dr. Gunnar Arbman (National Defence Research Establishment, Sweden) and Mr. Stanislaw Wilczkowiak (Ministry of Environmental Protection, Poland) in Poland.

In Geneva from 9-11 February 1998, a workshop for Subgroup 1 entitled "Highlighting the Relationship Between Serious Conflicts and Environmental Transformation" focussing on developing mechanisms for a threat assessment of environment and security was hosted by Mrs. Eva Affolter Svenonius (Swiss Agency for the Environment, Forests and Landscape) in Switzerland.

In Vienna on 23-24 March 1998, a workshop for Subgroup 3 entitled "Environment and Security in an International Context: Environmental and Developmental Policy Responses" was hosted by the Federal Ministry for the Environment, Youth, and Family Affairs, Republic of Austria and co-chaired by Ambassador Irene Freudenschuss-Reichl and Professor Gerhard Loibl. Back to back with this meeting, Austria hosted the fourth Plenary meeting, where the interim results from the subgroups were discussed and the editing process for the draft final report was co-ordinated.

In Paris from 27-28 April 1998, a workshop for Subgroup 3 entitled "Selected Foreign and Security Policy Responses" focussing on the development of foreign and security policy responses was hosted by the Secretariat General for National Defence (SGDN) in co-operation with the Ministry of Foreign Affairs and with the support of CREST and directed by Ambassador Berengere Quincy (formerly representing the French Secretariat General for National Defence (SGDN)).

The results of these workshops were compiled into a draft Pilot Study Full Technical Report by Ecologic in June 1998. An editing meeting was held in Washington DC in July 1998 and hosted by EBR. Detailed editing work was completed by the editing group which resulted not only in changes in terminology, but clarified the concepts and terms used. The draft Full Technical Report was then distributed to participants of the Pilot Study and to selected peer reviewers and external experts.

The second and final editing meeting took place in November 1998 in Berlin, Germany hosted by Ecologic and chaired by Pilot Study Director, Kurt Lietzmann. During this second editing meeting, detailed comments received from both the Pilot Study participants and the selected peer reviewers were discussed in full as to how the Pilot Study Full Technical Report could be enhanced or improved. The editing group diligently worked on the draft of the Executive Summary Report as well. The remaining editing schedule was finalised and it was agreed that Ecologic would provide the final analysis and editing for the Full Technical Report and Executive Summary.

The Final Pilot Study Plenary meeting was held on 13-14 January 1999 in Vancouver, Canada and hosted by Mr. Anthony T. Downs, Director-General Environment, Department of National Defence, Canada. The final meeting was attended by a large number of participants where the final comments and recommendations were discussed in-depth. Following this discussion, an approval by consensus was reached on the Full Technical Report and the Executive Summary to be submitted in March 1999 to the NATO/CCMS Plenary.

### ***Importance of the Pilot Study***

The Pilot Study's final product compiles existing state of the art research on the relationship between environmental change and security. At the same time, a large part of the Pilot Study's work is dedicated to developing parameters for response mechanisms directed towards political stakeholders from different policy sectors. The focus of these responses is on reducing the potential incidence or escalation of conflict, inter alia, enhancing security at the earliest possible stage. The structure of the Pilot Study reflects this orientation towards framing practical action. Another characteristic of this Pilot Study is that it deals with a broad social science issue

discussing innovative policy responses for dealing with environmental stress and its potential effects on security.

Starting from Article 2 of the North Atlantic Treaty, which provides that parties will contribute towards the further development of peaceful and friendly international relations by promoting conditions of stability and well-being, this Pilot Study responds to the aim evolving from the 1991 Declaration on Peace and Co-operation, which defined its tasks to further evolve its partnership with countries in Central and Eastern Europe. Its results need to be interpreted under the umbrella of the Strategic Concept for the 21st Century which will be adopted at the Washington DC NATO Summit in April, 1999.

Today's broadened security challenges differ from the traditional ones in their expanded geographical reach. Therefore the results of the study are relevant for a larger audience, including other international organisations. As a result, this Pilot Study integrated other international organisations in its work with participation by representatives of the United Nations Development Programme and Environmental Programme, UN Economic Commission for Europe (UNECE), Organisation for Security and Co-operation in Europe (OSCE), Organisation for Economic Co-operation and Development (OECD) and the World Bank. This new approach follows

the principle of integrating different policy sectors at the international level.

The Pilot Study also involved a wide range of experts from different fields and institutes. Policy makers, researchers, diplomats, and representatives of NGOs covering various policy areas, participated in the study by adding their respective expertise to address the topic of environment and security. The study benefited from the different insights drawn from the fields of environmental policy and research, conflict research and security studies, and development and foreign policy.

## Pilot Study Findings

Presented in this section are the Pilot Study's main findings and policy responses. The findings from the Full Technical Report will be presented in this section according to the structure of the relevant chapters from the Pilot Study. In the Full Technical Report, the study is divided into the following chapters:

- Chapter 1: NATO Security Context (provides an overview of the North Atlantic Treaty, CCMS, and the Changing Security Context);
- Chapter 2: Assessing the Links between Environment and Security (clarifies the concepts between environmental stress and security; examines the consequences of environmental stress and their potential impact on the incidence or escalation of conflict; discusses contextual factors which may impact the consequences of environmental stress);
- Chapter 3: Typology of Environmental Conflict Cases (describes further the relevance of environmental stress, socio-economic conditions, contextual factors and conflict; exhibits the results of empirical research including historical cases and inductively derived case studies);
- Chapter 4: Integrated Risk Assessment (analyses and compares the conflict potential or security risk of specific unfavourable socio-ecological patterns; identifies regions that are affected by environmental stress factors or syndromes);
- Chapter 5: Indicators, Data and Decision Support Systems (presents a set of practical options to support policy makers for the development of early warning indicator systems, data bases, and decision support systems);
- Chapter 6: Policy Responses (presents an integrated approach of all policy areas and policy responses for environmental, development, foreign and security policy).



## Key Findings

- *Although nations continue to be central actors in international politics, they increasingly participate in a multitude of international regimes and institutions. Nations are engaging in co-operation with international and regional organisations to respond to non-traditional security concerns including the environment.*
- *The North Atlantic Treaty recognised from its beginning that security is not entirely a function of military power or geopolitical strength. It recognises the need to include an economic, and to a lesser extent, a social dimension to its conception of security (see Art. 2 of the Treaty). This civil security dimension is given an institutional framework through the NATO Committee on the Challenges of Modern Society (CCMS).*
- *Since the end of the Cold War, NATO looks increasingly at threats from non-traditional sources and addresses Alliance security in an expanded regional and global context. This new and broader security concept - the Strategic Concept of 1991 - complements the emphasis on the defence dimension of security and recognises that security and stability have political, economic, social and environmental elements.*
- *The broad approach to security is reflected in three mutually reinforcing elements of Alliance security policy: dialogue, co-operation and collective defence. These elements should support NATO in remaining flexible and responsive to changing security conditions, so that its important role in the new security context can be guaranteed for the future.*
- *The most serious impacts of environmental stress, due to transboundary effects, are likely to emerge in regions other than the Euro-Atlantic region, such as developing countries and countries in transition. Preventing the breakdown of global systems is a high policy priority for a number of states and the environment is understood as one of these global systems.*
- *With reference to Article 4 of the North Atlantic Treaty, any issue can be brought before the Alliance for the purpose of consultation with other Member States when one Member State perceives the territorial integrity, political independence or security of any of the Member States is threatened. This could conceivably include an environmental issue.*
- *As NATO provides the available fora for consultation and co-operation, to include EAPC and the PFP, environmental issues with security implications for Member States and Partner Countries can be addressed or resolved in the same fashion. This includes the development and co-ordination of data sharing and exchange arrangements for regional monitoring networks. Beyond data collection and monitoring, NATO will have to rely on co-operation with other respective organisations for preventive action.*
- *The broad understanding of security increases the need for more co-operation among regional and international security institutions, such as WEU, OSCE, and UN as well as between security institutions and institutions in other policy areas such as environment, development and foreign and security policy.*

At the threshold of the 21st Century, societies are facing non-traditional threats to security such as economic decline, social and political instability, ethnic rivalries and territorial disputes, international terrorism, money laundering, drug trafficking and environmental stress. The regions most likely to experience the potential incidence or escalation of conflict fall outside of the Euro-Atlantic region in developing countries or countries in transition. Preventing the breakdown of global systems is a high policy priority for a number of states and the environment is understood as one of these global systems.

These security concerns are redefining the traditional missions of security organisations including NATO. The North Atlantic Treaty recognised from the beginning that security is not entirely a function of military power or geopolitical strength. It recognises the need to include an economic, and to a lesser extent, a social dimension to its conception of security (see Article 2 of North Atlantic Treaty). This civil security dimension is given an institutional framework through the NATO Committee on the Challenges of Modern Society (CCMS).

Since the end of the Cold War, NATO looks increasingly at threats from non-traditional sources and addresses Alliance security in a broader context. This context is expanded by the Strategic Concept of 1991 which complements the emphasis on the defence dimension of security and recognises that security and stability have political, economic, social and environmental elements. Part of this changing security context is that nations, although still central actors in international politics, increasingly participate in a multitude of international regimes and institutions. Nations are engaging in co-operation with international and regional organisations to respond to non-traditional

security concerns including the environment. With reference to Article 4 of the North Atlantic Treaty, any issue can be brought before the Alliance for the purpose of consultation with other Member States when one Member State perceives the territorial integrity, political independence or security of any of the Member States is threatened. This could conceivably include an environmental issue.

Within the NATO framework, the broad approach to security is reflected in three mutually reinforcing elements of Alliance security policy: dialogue, co-operation and collective defence. These elements should support NATO's flexibility and responsiveness to changing security conditions, so that its important role in the new security context can be guaranteed for the future. As NATO provides the available fora for consultation and co-operation, to include the Euro-Atlantic Partnership Council (EAPC) and the Partnership for Peace (PfP) countries, environmental issues with security implications for Member States and Partner Countries can be addressed or resolved in the same fashion. This includes the development and co-ordination of data sharing and exchange arrangements for regional monitoring networks. Beyond data collection and monitoring, NATO will have to rely on co-operation with other organisations for preventive action. This will call for more co-operation among regional and international security institutions, such as the Western European Union (WEU), Organisation for Security and Co-operation in Europe (OSCE), and the United Nations (UN) as well as between security institutions and institutions in other policy areas such as environmental, development, foreign and security policy.

## Assessing the Links between Environment and Security

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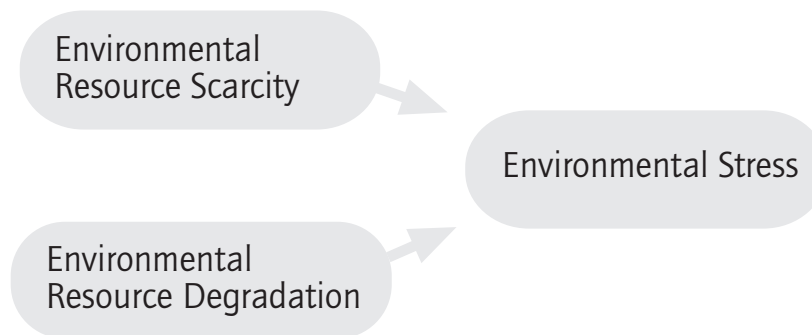
### Key Findings

- *Environmental stress comprises scarcity of natural, renewable resources (quantitative degradation) as well as qualitative resource degradation. As both factors are closely interconnected – environmental degradation can increase scarcity as well as scarcity can further degrade a resource by overexploitation - they are considered as one variable in the context of the Pilot Study.*
- *Conflict is understood as a dynamic process with different levels of intensity along a continuum ranging from highly co-operative to highly conflicted situations (durable peace, stable peace, unstable peace, crisis, war).*
- *Violence is by no means the automatic outcome of conflict. Countless issues of conflict, particularly at the local or regional level, are resolved co-operatively; only a limited number reach a higher conflict intensity.*
- *The relationship between environmental stress and conflict is characterised by:*
  - *Multi-causality: environmental stress contributing to conflict almost always interacts with other political, social and economic factors and evolves through various multi-stages before it results in conflict;*
  - *Reciprocity and feedback loops: the relationship between environmental stress and conflict is recursive, because just as environmental stress can lead to conflict under unfavourable contextual factors, conflict can lead to more environmental stress;*
  - *Consequences of environmental stress: poverty, food insecurity, poor health conditions, displacement, (migration or refugee movements), and disruption of the social and political institutions are regarded as the most important consequences from environmental stress, which then contribute to conflict under a certain set of unfavourable contextual factors.*
- *Environmental stress can also play different roles along the conflict dynamic. It can be a structural source of conflict, as well as a catalyst for conflict, or a trigger for conflict.*
- *Similar types of environmental stress may have different effects on the incidence of violence. Therefore the socio-economic and political context, in which environmental stress occurs, has to be taken into consideration while assessing the conflict potential of different environmental stress. These contextual factors identified comprise patterns of perception, economic vulnerability and resource dependency, institutional, socio-economic and technological capacity, cultural and ethno-political factors, violence-potential and internal security structures, political stability, participation, international interaction, and mechanisms of conflict resolution.*

The relationship between environmental change and security has been of increasing importance in recent years in both the scientific and policy communities as new challenges to security emerge in the post-Cold War context. In consideration of the complexity of the causal pathways of the relationship between environmental change and security, this section lays the foundation, elaborating on the relationship between environmental stress, its political, economic, social and demographic consequences and their impact on security by interpreting the current available literature.

We conceive of environmental change in terms of the nature and extent of environmental stress. We define the independent variable, environmental stress, as the scarcity and environmental degradation of natural, renewable resources (quantitative and qualitative resource degradation). As both factors are closely interconnected – environmental degradation can increase scarcity and scarcity can further degrade a resource by overexploitation – they are considered as one variable in the context of the Pilot Study (see figure 2.1).

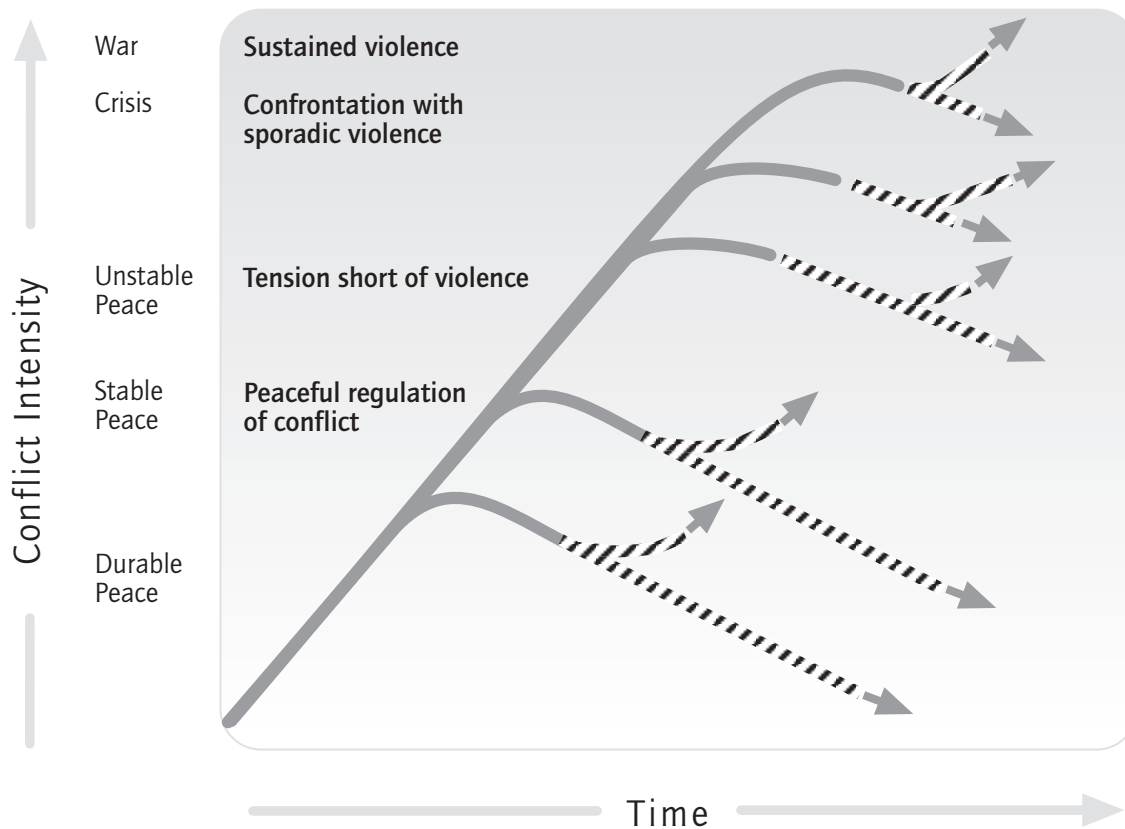
Figure 2.1 - Environmental Stress



The understanding of security in our Pilot Study analysis generally includes the integrity of national territory, protection of political independence and national sovereignty, and stability at the international political level. The inverse of these conditions can be characterised by our operationalised dependent variable, the potential incidence or escalation of conflict.

Conflicts are understood as dynamic processes with different levels of intensity along a continuum ranging from highly co-operative to highly conflictual situations (durable peace, stable peace, unstable peace, crisis, war) (see figure 2.2).

Figure 2.2 - Conflict Dynamic



This conflict dynamic suggests that issues can be resolved before conflict develops into a security threat. Countless issues of conflict, particularly at the local or regional level, are resolved co-operatively; only a limited number of conflicts reach a higher conflict intensity. The figure also depicts the notion that violence is by no means the automatic outcome of conflict.

The relationship between environmental stress and conflict is characterised by:

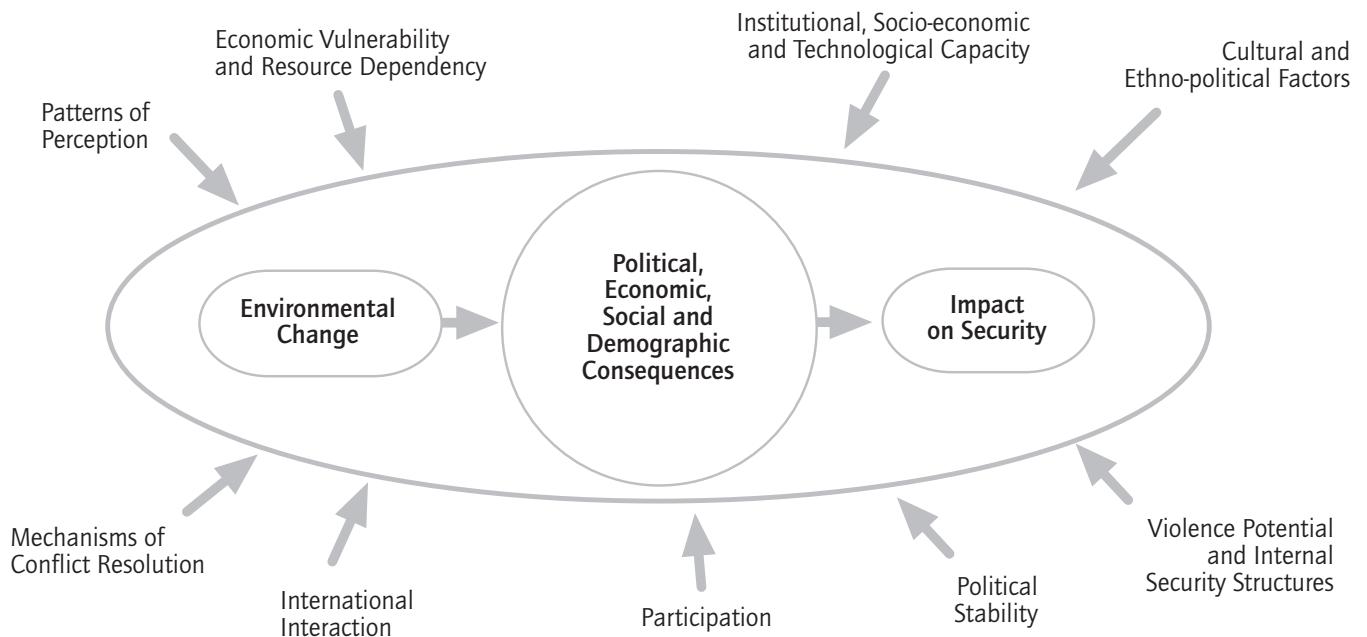
- Multi-causality: environmental stress contributing to conflict almost always interacts with other political, social and economic factors and evolves through various stages before it results in conflict;
- Reciprocity and feedback loops: the relationship between environmental stress and conflict is recursive; just as environmental stress can lead to conflict under unfavourable contextual factors, conflict can lead to more environmental stress;
- Consequences of environmental stress: poverty, food insecurity, poor health conditions, displacement, migration or refugee movements, and disruption of the social and political institutions are regarded as the most important consequences of environmental stress, which then contribute to conflict under a certain set of unfavourable contextual factors.

Environmental stress can also play different roles along the conflict dynamic. It can be a:

- **Structural source of conflict:** environmental stress is perceived as a permanent factor affecting the interests and preferences of the actors involved;
- **Catalyst for conflict:** environmental stress is further exacerbated by an existing unstable socio-economic situation and the resulting impacts are the increase in the potential incidence or escalation of conflict;
- **Trigger for conflict:** environmental stress instigates conflict when underlying causes for conflict are perceived as acute threats to a group's interests due to an unfavourable, sudden change in the environmental sphere.

Similar types of environmental stress may have different effects on security. Therefore the socio-economic and political context in which environmental stress occurs has to be taken into consideration when assessing the conflict potential of different types of environmental stress. Figure 2.3 shows that contextual factors influence whether environmental change causes social, economic, and political and demographic consequences which in turn impact on security. The contextual factors influence the process at a very early stage and vary accordingly to the different environmental stress conditions characterised within a country. Contextual factors have either a facilitating or inhibiting effect on the relationship between environmental stress and conflict. Relating back to our original hypothesis on the relationship between environmental change and security we have developed the following conceptual model (see figure 2.3).

Figure 2.3 - Conceptual Model: Relationship Between Environmental Change and Security



The contextual factors identified are as follows:

- **Patterns of perception:** Whether or not environmental stress contributes to the potential incidence or escalation of conflict depends heavily upon the perceptions of the actors. For example, if environmental stress is perceived as directly impacting on an actor's interests and priorities, including threats to their physical or economic well-being, actors are more willing to escalate the conflict.
- **Economic vulnerability and resource dependency:** Economic vulnerability and resource dependency differ enormously among countries, but also among regions or social groups. The vulnerability caused by dependence on a degrading resource – such as fresh water – may enhance the probability of the incidence of conflict. Migration or flight are often the result of extreme dependence on a degrading resource, causing socio-economic and political stress in the receiving nation or state.
- **Institutional, socio-economic and technological capacity:** Institutional capacity of a government is a precondition for co-operative action on environmental stresses and their consequences. Socio-economic and technological capacities of a society and a government are further requirements for the reduction of environmental stress and the amelioration of its negative consequences.
- **Cultural and ethno-political factors:** The existence of ethnic, cultural or religious differences do not in themselves lead to conflict, but they can contribute to the incidence or escalation of conflict if they develop into a political problem. These differences may be exacerbated by an inequitable distribution of wealth, services or access.
- **Violence-potential and internal security structures:** The incidence of conflict or the escalation to violence may be determined in part by the degree of civilian control of the military, the internal security services and law enforcement agencies. If these democratic structures do not exist, and these institutions are dominated and potentially instrumentalised by a certain group in the society, they might be used as a tool to resolve potential conflicts by force.
- **Political stability:** Social and economic factors are closely inter-linked with the political dimension of the state. Instability exists when the political system and the government are unable to effectively control tensions between different groups in the society or between the government and the opposition.
- **Participation:** Empirical research on cases of environmental stress has shown that in many instances local groups who were directly affected by the decision, for example the exploitation of a resource, and who were not involved in the decision-making process, had a low acceptance rate of the decision itself. Participation can be realised through mechanisms such as free and fair elections, petitions, or it can be realised through traditional or culturally specific mechanisms.
- **International interaction:** The constructive engagement of a country in international interactions enhances co-operative resolution of the negative consequences of environmental stress. It encourages a state to adhere to international environmental treaties and encourages it at the same time to comply to international regimes, to adjust to international standards.
- **Mechanisms of conflict resolution:** The presence of effective and legitimate legal, political and social mechanisms of conflict resolution enhances the possibility of resolving conflict within a state or between states. In participatory societies countless and sometimes serious environmental conflicts are resolved by legal, political and social mechanisms, where negotiation, compromise and mediation play a central role.

## 3 Typology of Environmental Conflict Cases

### *Key Findings*

- *A typology of environmental conflict developed in the context of the Pilot Study reflects the complexity of the relationship between environmental stress, its consequences and contextual factors as well as actors. This typology can be understood as a research hypothesis, subject to further testing since the grouping of cases used were derived inductively.*
- *Cases where environmental stress heightens the potential incidence of conflict generally manifest themselves in developing or transitional societies in socio-economic crisis. These conflicts can typically occur at the local or regional levels where marginalisation or discrimination of one or more actors is common.*
- *Four general types of environmental conflict can be identified which fulfil the complexity requirements of a typology: ethno-political conflicts; migration conflicts (internal, cross border, demographically caused migration); international resource conflicts; and environmental conflicts due to global environmental change.*
- *According to this typology of environmental conflicts, there are many cases that have been solved without violence, demonstrating that there is a large potential for local, regional and international co-operation in the various policy arenas.*

To further illustrate the relevance of the conceptual framework presented in Chapter 2, the results of empirical research, including historical case studies in which environmental stress influenced the onset of conflict, are presented in this chapter. These cases are categorised and placed into a typology to further assist decision makers and policy analysts in understanding the relationship between environmental stress and security. A typology of environmental conflict developed in the context of this Pilot Study reflects the complexity of the relationship between environmental stress and its consequences, contextual factors and actors. This typology [based primarily on the Environmental Conflicts Project (ENCOP)] can be understood as a research hypothesis, subject to further testing since the grouping of cases used were derived inductively.

According to the ENCOP categories and typology, it has been found that cases where environmental stress heightens the potential incidence of conflict were generally manifest in developing or transitional societies in socio-economic crisis. These conflicts can typically occur at the local or regional levels where commonly there is a marginalisation or discrimination of one or more actors. Four general types of environmental conflict can be identified which fulfil the complexity requirements of a typology:

- Ethno-political conflicts are characterised by a coincidence of environmental and ethnic discrimination. Conflicts may emerge when two or more ethnic groups share one eco-region suffering from environmental stress and have limited access to the needed natural resources. Conflicts may also emerge when ethnic groups depend on neighbouring eco-regions territory.



- Migration conflicts are either based on internal migration, cross-border migration or have a strong demographic component.

- Internal migration conflicts are triggered by voluntary migration or forced displacement of inhabitants from one region to another within one country. The geographic origin of migrants or displaced persons is the primary criterion for conflicting social and political relationships between the actors. Migration is induced by structural changes such as persistent drought, flood, and soil erosion (desertification) or forced displacement and expulsion in connection with large unsustainable industrial projects, mineral extraction, dam projects and forestry.

- Cross border migration conflicts are in general characterised by the same causes as internal migration conflict. When migrants or refugees cross national borders voluntarily, resettle in rural border areas or resettle in cities of a third country, they represent socially and at times a source of political conflict potential.

- Demographically caused migration conflicts are characterised by high population pressure in

eco-regions of low productivity leading to migration either to more favourable economic or to remote natural areas. They are likely to escalate when migrants compete with other groups for scarce resources.

- International resource conflicts are characterised by distribution problems. They are caused by an asymmetrical dependence on the quantity and quality of a resource, for example fresh water or fish stocks. The likelihood of violent escalation of international resource conflicts depends heavily on the specific constellation of contextual factors. Under favourable contextual factors, these conflicts may be resolved co-operatively.

- Consequences of global environmental change have not resulted in violent conflict thus far. However, the implementation of specific international environmental agreements has led to tensions between nations in a number of areas.

According to this typology of environmental conflicts, there are many cases that have been resolved without violence, demonstrating that there is a large potential for local, regional and international co-operation in the various policy areas.

## 4 Integrated Risk Management

### *Key Findings*

- *The nature of the relationship between environmental stress and security is indirect and multi-casual. Environmental stress can be prioritised according to time of impact, geographic area effected and magnitude of stress.*
- *The consequences of environmental stress (political, economic, social and demographic) tend to be highly inter-related and the integrated risk assessment needs to address those relationships in assessing them.*
- *The complexity of the relationship between the consequences of environmental stress and the potential incidence or escalation of conflict is best controlled through the use of pattern matching; the Syndrome Approach of the German Government's Advisory Council on Global Change provides a set of experimental hypotheses as templates for pattern matching.*
- *The syndrome-based risk assessment is one approach that can help in identifying priorities for the development of early warning indicators and preventive action.*
- *Some preliminary research findings suggest that certain syndromes are more prone than others to the onset or escalation of conflict.*
- *Further development of the syndrome approach is also required to enable researchers, development practitioners and politicians alike, to more effectively concentrate on critical regions and critical interdependencies in the future.*

This section on integrated risk assessment establishes guidelines for assessing and prioritising the potential impact of different types of environmental change on security. Here, we assess the risk of increasing the potential incidence or escalation of conflict. The assessment is termed integrated because of the broad range of factors that are considered (political, economic, social, demographic and environmental factors). Chapter 2 established that environmental stress may generate a series of consequences (political, economic, social and demographic) and that those consequences impact on the potential incidence or escalation of conflict. This relationship might be further influenced by a series of structural or contextual factors.

The nature of the relationship between environmental stress and security is indirect and multi-causal. Environmental stress can be prioritised according to time of impact, geographic area affected and magnitude of stress. The integrated risk assessment needs to control or manage the complexity in the relationship between the consequences of stress and contextual factors in order to determine which factors have the most potential impact on the incidence or escalation of conflict. The complexity of this relationship is best controlled through the use of pattern matching. The Syndrome Approach developed by the German Government's Advisory Council on Global Change (WBGU) and the Potsdam-Institute for Climate Impact

Research (PIK), provides a set of experimental hypotheses as templates for pattern matching which help to control for complexity in the integrated risk assessment.

The Syndrome Approach provides a number of identifiable patterns of environmental stress. Identifying the potential set of consequences and their pattern of interaction in the context of a specific set of variables may allow for a broader set of potential responses for policy-makers. The syndrome-based concept starts from the assumption that environmental stress is part of a dynamic human-nature interaction. The Syndrome Approach identifies different types of these interactions which occur in various environmental, administrative or geopolitical regions of the world. The overall importance of the syndrome-based approach for policy makers is that it may serve as a promising starting point for the development of indicators for early intervention in the conflict dynamic and may provide the opportunity to reduce the potential incidence of conflict or its

escalation in specific cases. There are sixteen syndromes (see Table 4.1) almost all of which are experimental hypotheses and are divided into the three subgroups 'resource use', 'development', and 'sinks'.

A fully functional integrated risk assessment approach must correlate these syndromes with the potential for conflict. Some preliminary research findings suggest that certain syndromes are more prone than others to the onset or escalation of conflict. Additional empirical testing in this area is likely to confirm meaningful relationships between particular syndromes and conflict potential. This can be translated into a practical integrated risk assessment tool for policy-makers to let them know when, where and how a syndrome might lead to conflict. Further development of the Syndrome Approach is also required to enable researchers, development practitioners and politicians alike, to more effectively concentrate on critical regions and interdependencies in the future.

Table 4.1 - Overview of Global Change Syndromes

<b>Utilisation Syndromes</b>	
1. Sahel Syndrome	Overcultivation of marginal land
2. Overexploitation Syndrome	Overexploitation of natural ecosystems
3. Rural Exodus Syndrome	Environmental degradation through abandonment of traditional agricultural practices
4. Dust Bowl Syndrome	Non-sustainable agro-industrial use of soils and bodies of water
5. Katanga Syndrome	Environmental degradation through the extraction of non-renewable resources
6. Mass Tourism Syndrome	Development and destruction of nature for recreational ends
7. Scorched Earth Syndrome	Environmental destruction through war and military action
<b>Development Syndromes</b>	
8. Aral Sea Syndrome	Environmental damage of natural landscapes as a result of large-scale projects
9. Green Revolution Syndrome	Environmental degradation through the introduction of inappropriate farming methods
10. Asian Tigers Syndrome	Disregard for environmental standards in the course of rapid economic growth
11. Favela Syndrome	Environmental degradation through uncontrolled urban growth
12. Urban Sprawl Syndrome	Destruction of landscapes through planned expansion of urban infrastructures
13. Major Accident Syndrome	Singular anthropogenic environmental disasters with long-term impacts
<b>Sink Syndromes</b>	
14. Smokestack Syndrome	Environmental degradation through large-scale diffusion of long-lived substances
15. Waste Dumping Syndrome	Environmental degradation through controlled and uncontrolled disposal of waste
16. Contaminated Land Syndrome	Local contamination of environmental assets at industrial locations

## Key Findings

- *Existing research findings in the environment and security field can provide useful direction for the design of early warning indicator systems and decision support systems. Further research is required to specify, focus and simplify research results so that they can be useful directly for policy-makers.*
- *It is recommended that tracking and monitoring environmental and contextual indicators are essential in order to assist analysts in forecasting the potential incidence of conflict and to determine the potential of existing conflicts to escalate along the conflict continuum. The contextual indicators are critical in forecasting which environmental stresses are likely to produce conflictual outcomes.*
- *To be useful for early warning, indicator systems must provide indication of critical problems and thresholds at very early stages, when it is still possible to avert future instability. Warning indicators generally refer to anticipated environmental stress; contextual factors associated with environmental stress; and, consequences of environmental stress.*
- *It is preferable to focus on indicators that reveal levels of anticipated environmental stress.*
- *When sustainable development indicators are stressed beyond certain thresholds or reference values, they are likely to lead to unsustainable policies and practices and be potential contributors to conflict. Reference values identify the thresholds at which changes over time in environmental indicators are transformed from being beneficial or neutral to being negative or risk-provoking along some dimension. These values are regionally or systemically specific and they may change over time.*
- *Reference values can be conceived in three ways: based entirely on scientific evidence; based on policy targets, usually scientific evidence in the context of national economic capability, technological capacity, or political will; and based in terms of public perception.*
- *Due to the large number of indicators available, more research is needed to reduce these indicators to a number more manageable for policy support. In order to be useful for policy-makers, indicators should be readily understandable and interpretable. There are two approaches to controlling for indicator complexity: development of a single index by statistically or mathematically aggregating multiple indicators; and development of "marker indicators" through the selection of a small number of indicators from a much larger pool which correlate strongly with particular concepts.*
- *Simple and practical decision-support systems can be developed to provide early warning to policy-makers using existing data resources. They should be oriented toward providing early warning of the potential for conflict.*
- *Decision support systems should be capable of evaluating how particular environmental problems are affected by contextual factors that may facilitate or exacerbate their potential impact on the incidence or escalation of conflict. They should be able to provide useful analysis and recommended responses at different stages of the conflict dynamic.*

Much of the research findings in this Pilot Study suggests that the development of early warning indicator systems, data bases and decision support systems are feasible and warranted. Although the development of practical approaches could not be finalised in this Pilot Study, further research is required to specify, focus and simplify research results so that they can be useful directly for policy makers. This chapter presents a set of options, grounded in existing research, that offer practical solutions to support policy makers.

First, it is recommended that tracking and monitoring a large number of environmental and contextual indicators are essential in order to assist analysts in forecasting the potential incidence of conflict and to determine the potential of existing conflicts escalating along the conflict continuum. The contextual indicators are critical in forecasting which environmental stresses are likely to produce conflictual outcomes.

Second, to be useful for early warning, indicator systems must provide an indication of critical problems and thresholds at very early stages, when it is still possible to avert future instability. It is preferable to focus on indicators that reveal levels of anticipated environmental stress. Warning indicators generally refer to anticipated environmental stress, contextual factors associated with environmental stress, and consequences of environmental stress.

Third, when sustainable development indicators are stressed beyond certain thresholds or reference values, they are likely to lead to unsustainability and be potential contributors to conflict. Reference values identify the thresholds at which changes over time in

environmental indicators are transformed from being beneficial or neutral to being negative or risk-provoking along some dimension. These values are regionally or systematically specific and they may change over time. Reference values can be conceived in three ways: based entirely on scientific evidence, based on policy targets, usually scientific evidence in the context of national economic capability, technological capacity, or political will, and based in terms of public perception.

Fourth, due to the large number of indicators available, more research is needed to reduce these indicators to a more manageable number for policy support. In order to be useful for policy makers, indicators should be readily understandable and interpretable. There are two approaches for controlling indicator complexity: development of a single index by statistically or mathematically aggregating multiple indicators, and development of "marker indicators" through the selection of a small number of indicators from a much larger pool which correlate strongly with particular concepts.

Finally, simple and practical decision support systems can be developed to provide early warning to policy makers using existing data resources. They should be oriented toward providing early warning of the potential for conflict. Decision support systems should be capable of evaluating how particular environmental problems are affected by contextual factors that may facilitate or exacerbate their potential impact on the incidence or escalation of conflict. They should be able to provide useful analysis and recommend responses at different stages of the conflict dynamic.

*The previous chapters identified the complex inter-linkages between environmental stress and the potential incidence or escalation of conflict. The multitude of socio-economic and political factors influencing environmental conflict and the different manifestations of conflict call for a co-operative and integrative approach towards the prevention of environmental conflict and its peaceful resolution. This approach must integrate response mechanisms from the environment and development policy and from the foreign and security policy sector. Within this section, policy recommendations which share the principles of sustainable development, precaution, integration and co-operation are suggested for further action. Based on their comparative advantages, each policy sector can contribute, with its specific problem-solving mechanisms and instruments, to the prevention or management of the incidence or escalation of conflict at different geographic levels and different stages of the conflict dynamic. Since environmental stress often contains the seeds for both conflict and co-operation, it is suggested that all actors integrate the conflict dimension into their thinking and policy mechanisms and to mutually co-ordinate their response mechanisms. Co-operation on shared environmental issues can establish lines of communication that may be valuable in reducing regional tensions on non-environmental problems. As the global commons cannot be managed by any nation state alone, co-operation of governmental and non-governmental actors at the different levels has to be enhanced in preventing and managing environmental conflict.*

### ***Environmental Policy Key Findings***

- *Environmental stress poses a potential threat to security at all geographic levels, and can have consequences across a range of levels, such as global environmental stresses which may raise the potential incidence and escalation of conflict at the local and regional levels. Taking preventive action on environmental stress thus is the most appropriate approach to preventing environmental conflicts. Such preventive action is needed at all levels, but given that environmental stresses tend to be rooted in transboundary, regional and global environmental problems, international and regional environmental agreements play a particularly important role in preventing environmental conflict.*
- *Environmental policy at the national level and through international institutions has achieved a remarkable record of progress in the last two decades (e.g. air pollution abatement, protection of the ozone layer). In addition to their role in promoting a better environment, co-operative environmental institutions have contributed to confidence building and to avoiding conflict escalation between countries (e.g. management of river basins). However, a number of environmental challenges have grown in importance and the security relevance of environmental stress has increased. Efforts to address environmental stress, its consequences, and their impact on the potential incidence or escalation of conflict thus need to be intensified.*
- *In addition to improving the common knowledge base of policy-making on the relationship between environment and security, comprehensive assessment mechanisms need to be developed which take the environmental impacts of policies into account. They should also be extended to assess socio-economic impacts of environmental stresses on social, political, and economic conditions and on security. These comprehensive assessment mechanisms should be institutionalised and used at all levels of decision-making as a standard operating procedure for integrating environmental considerations and security concerns of environmental change that will include the modification or abandonment of projects, programs or policies. Other policy areas such as transport, agriculture, energy, social and security policies need to make further progress in taking a long-term perspective and internalise external costs.*

- *There is great need for strengthening, re-examining, and reforming the international institutional framework, especially in a regional context. This relates in particular to natural resource regimes, international environmental law, and the role of UN institutions. Efforts should be intensified, particularly in regional contexts, to codify rules for the management of natural resources and especially shared water resources. Existing agreements, e.g. to combat desertification and manage the use of resources, should be strengthened.*
- *To benefit fully from international and regional environmental agreements, they must be ratified, implemented and enforced effectively. To improve implementation, the transfer of knowledge and technology should be enhanced, and existing mechanisms for capacity building strengthened. International financing must be made available and innovative implementation instruments, including market-based instruments such as emissions trading and joint implementation and common policies and measures, further explored and properly applied.*
- *Strengthened verification and compliance mechanisms, possibly including binding consequences and penalties in cases of non-compliance, can enhance mutual trust and confidence among parties to international environmental agreements. Efforts are also needed to foster mechanisms for amicable dispute resolution, especially in resource regimes. In this context, existing dispute settlement procedures (International Court of Justice, World Trade Organisation) as well as other innovative approaches deserve consideration.*
- *Decision-making in international institutions needs to be facilitated. This can, inter alia, be achieved through an increased use of innovative procedures of majority decision-making and other innovative approaches to consensus building. This includes the establishment of expert panels on specific questions and focused round-table discussions. Such mechanisms also allow for broader societal and non-governmental input. Basic participatory rights of non-governmental actors such as access to information, documentation and decision-makers need to be guaranteed. In general, public and private efforts and activities are to be co-ordinated and integrated for effective solutions.*
- *Given the large and increasing amount of international environmental institutions, a review should be initiated with the aim of streamlining the body of existing rules. At the global level, relevant international bodies such as UNEP should be strengthened, enabling them to work effectively to solve environmental problems which pose potential security threats. In addition, exchange, integration and co-operation among the diverse institutions involved in the fields of environment and security should be enhanced which may involve establishing new fora and structures.*

## **Development Policy Key Findings**

- *In order to establish preventive mechanisms for environmental conflicts, development policy, which is specifically directed at ameliorating selected consequences and contextual factors, plays an important role in respective regions. Development policy contributes to stabilising the socio-economic and political context of actors experiencing environmental stress and can contribute to the prevention of environmental conflict. At the same time, it can be positively employed in post-conflict phases by supporting political, economic and administrative reforms to change past structures which have contributed to conflict. Development co-operation can address both the consequences of environmental stress and the prevention of environmental stress at the different stages along the conflict continuum.*
- *To prevent deep-rooted societal conflicts, there are a number of possible sustainable development measures that should be implemented, ranging from sustainable economic growth and poverty reduction programs to strengthening equity, democratisation and respect for human rights. The strengthening of local and sub-regional authorities and self-government bodies and the involvement of local participants in the development process are important prerequisites*



*to enable the incorporation of the society into participatory structures. Democratic processes should be strengthened, allowing for the creation of a climate and the capacity for constructive interaction between civil society and government, a requirement for long-term sustainability.*

- *Multilateral and bilateral development co-operation is one approach to preventing conflict and ensuring sustainability. Development co-operation with the goal of sustainable human development needs to address specific population policies to offer solutions, for both environmental stress and rapid population growth. Economic decline or unequal economic growth may heighten tensions and contribute to the potential incidence or escalation of conflict. Therefore there is a need for shared and co-ordinated approaches to development co-operation among the various international donors and regional bodies to allow for more effective and appropriate conflict prevention and peace building. Selected forms of development assistance should be shaped by the varying potentials of the countries involved, according to the needs and interests of their populations. Preventing unnecessary debt burden and economic dependency is a critical component to sustainable development.*
- *The various institutions in the global community are asked to continue improving the different responses mentioned above. The need to scale up popular development initiatives implies turning attention not only to national political structures, but also to developing sound long-term macroeconomic stabilisation plans and continued financing for projects. This involves the need for improving the methods for organisations and related groups to exchange information, to create and maintain feasible budgets for project implementation, to adopt common approaches for economic and aid co-ordination, and to provide mutual support. It also entails building new forms of international co-operation via the reform of existing global institutions and for all donors to improve common standards for safeguards which prevent negative social impacts resulting from development projects.*

## ***Foreign and Security Policy Key Findings***

- *As environmental conflict is a cross-sectoral issue, it also calls for foreign and security policy responses in order to prevent escalation and to address the underlying consequences of environmental stress. Security institutions should increase their awareness of the links between environmental stress and security in order to contribute to the prevention of environmental conflicts. Environmental issues are valuable in establishing dialogue and co-operation. They serve as confidence building measures that may be used to promote regional stability. The aim of the responses enumerated in the following is to establish links between environmental policy and foreign and security policy.*
- *This global, integrative and co-operative approach includes the contributions of foreign policy and security institutions' specific instruments and mechanisms which can support the prevention or resolution of conflicts. Enhancing co-operation and interaction amongst existing institutions based on their respective charters, missions and capabilities is needed. This will require communication among foreign and security policy actors and institutions with relevant development and environmental organisations and stakeholders within civil society. While environmental issues may serve as triggers to conflict that threaten regional stability, co-operation on commonly shared environmental issues can establish dialogue and lines of communication which are valuable in reducing regional tensions over non-environmental issues. The establishment of regular interaction and consultation at the different levels of policy-making is required for co-operative security and for information sharing.*

- *Security institutions should contribute to information sharing on the basis of available data, including early warning and remote sensing data, according to their respective mandates. In order to establish communication and exchange between security organisations and other relevant actors in the field of environment, the opportunity to designate, within security organisations, an official responsible for such a task could be discussed. Foreign and security institutions can enhance and strengthen the positive activities of the parties involved through the provision of confidence building involved through the provision of confidence building measures such as treaty monitoring and short-term stabilisation programs and impartial adjudication.*
- *As far as security institutions are concerned, existing prevention and dialogue mechanisms can be used to address the security impact of environmental issues, capitalise on the catalytic function of environmental co-operation for confidence building, and enhance dialogue and co-operation among themselves. The existing mechanisms of mediation, dispute settlement, conciliation and arbitration in the foreign and security field should be employed in environmental conflicts as appropriate. This includes the use of dispute settlement mechanisms of existing environmental regimes such as the International Court of Arbitration, and other principle international and regional security institutions such as UN and OSCE. Within NATO, the North Atlantic Council, the Euro-Atlantic Partnership Council, the Mediterranean Co-operation Group, the special relationship with the Russian Federation and the Ukraine all provide opportunities for consultation and preventive diplomacy.*
- *In the post-crisis management stage, a monitoring process which includes environmental, political, economic, social and demographic factors and the perceptions of threat should be established as a long term stabilisation measure. The international donor community, through short-term stabilisation projects, can demonstrate their potential advantages of de-escalating or resolving the conflict. Post-crisis management mechanisms should also assess the environmental stress generated over the course of the crisis and its resolution. Furthermore, it should consider the social, economic, demographic and political consequences resulting from environmental stress.*