

Culture, Communication and Globalization
International Relations and Global Order
Aalborg University
Spring 2012

ENVIRONMENTAL SECURITY

Ecological Footprint Towards a Greener Future



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Master's Thesis
10th Semester, Aalborg University
Supervisor: Sandro Nickel
May 2012
Characters: 116,840

“We will not enjoy development without security, we will not enjoy security without development, and we will not enjoy either without respect for human rights.”¹

¹ *In larger freedom; Towards Development, Security and Human Rights for All*. Report of the Secretary- General of the United Nations. United Nations. New York. 2005. Page 6

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Abstract

Over the past decades, due to the increase of challenges in coping with environmental problems such as climate change, environmental issues have been an important topic in the international agenda. This thesis approaches environmental issues in a security context, particularly the effects that environmental insecurity have on the populations well being. This thesis analyses the differences between more traditionalists' approaches and more contemporaneous approaches on security studies. The analysis of environmental security was based on a theoretical framework consisting of theories driving mainly from the Copenhagen and the Welsh Schools of Security Studies. This thesis concludes that there are five main areas that directly influence environmental security such as energy demand; climate change; institutionalization of the environment; insecurity and conflicts and also the perception populations have on environmental security. It also concludes that in order to mitigate climate change effects and assure environmental security, it is necessary to expand the already existing global governance network and direct it towards a greener future, it is also necessary for this network to include the participation of States and civil society as well as cooperation vehicles between the different international relation actors.

List of Abbreviations

ASEAN – Association of Southeast Asian Nations

CFC – Chlorofluorocarbon

CO₂ – Carbon Dioxide

GDP – Gross Domestic Product

GECHS – Global Environmental Change and Human Security Project

GHG – Greenhouse Gas

HDI – Human Development Index

HDR – Human Development Report

HPI – Human Poverty Index

IHI – Index of Human Insecurity

IOM – International Organization for Migration

IPCC – Intergovernmental Panel on Climate Change

MDGs - Millennium Development Goals

NGO – Non Governmental Organization

NO_x - Nitrogen oxides

OECD - Organization for Economic Co-operation and Development

PRIO – Peace Research Institute Oslo

SO_x - Sulfur Oxides

UN – United Nations

UNCED – United Nations Conference on Environment and Development

UNCEP - United Nations Conference on Environment and Development

UNDP – United Nations Development Programme

UNEP – United Nations Environmental Programme

UNFCCC - United Nations Framework Convention on Climate Change

1. Introduction

The degradation of the environment has been, for decades, a very delicate and controversial subject. Since the late 1990s with the fall of the Berlin Wall the world has been changing politically, economically and culturally. The economic development and the military security created the conditions for the emergence of the concept human security. The concept of Human Security, globalization and mass media created the conditions for global awareness movements concerning the environment.

Security is a vital part of national and international policies. Traditionally, security is concerned with the territorial integrity of sovereign States - military power is used by States to ensure the defense of their territory; Hobbes thoughts were crucial to the post Peace of Westphalia concept of a sovereign State and National Security; in his book *Leviathan* he considers a State as being a “Kingdom, which is an estate ordained by men for their perpetual security against their enemies”.² The idea of national security was particularly dominant during the Cold War, when military capabilities where in the core of the security strategies.³ This militarization of security changed after 1990, when the security concept was redefined in order to also embrace economic, environmental and social dimensions of security.

Some of the principal tasks to ensure Russia’s National Security according to the document release and approved by President Vladimir Putin in January 2000, among others are: maintaining its sovereignty and territorial integrity; the development of the country’s economy; the raising and maintenance of military power; “improving the ecological situation in the country.”⁴

² Hobbes, T. (1651). *Leviathan* . Printed at St. Pauls Church-yard. London. Pages 284-285

³ Baylis J. Smith S. Owens P. (eds) *The Globalization of World politics: An Introduction to International Relations*. Oxford University Press. Oxford. Page 229

⁴ National Security Concept of the Russian Federation 2010. Retrieved 06 March 2012, from <http://www.mid.ru/bdomp/nsosndoc.nsf/1e5f0de28fe77fdcc32575d900298676/36aba64ac09f737fc32575d9002bbf31!OpenDocument>

Georgia, after the Rose Revolution in 2003 also considers the well being of the environment in its National Security concept: “ensuring environmental security is especially important while implementing large-scale domestic and international projects.”⁵

The USA National Security Strategy of May 2010 is more specific than the previous ones by highlighting the Arctic Region as a “... region, where we seek to meet our National Security needs, protect the environment, responsibly manage resources, account for indigenous communities ...”.⁶

The process of globalization and the States quest for economic security resulted in disrespect towards the environment. However States, non-governmental organizations and other international relations actors have been gradually introducing environmental problems in their agendas. As the causes of environmental degradation are global, the States should find the answers to solve this problem globally, however that might lead to a waiver of rights and not all States are ready for that. How helpful it is if most countries are prepared to change their legal systems and stop *business as usual* if the countries that pollute the most are not prepared to change their way of doing business and their relationship with the environment? Could his lack of commitment with the environment lead to conflict? What should be done to prevent the hazard effects of climate change?

⁵ National Security Concept of Georgia . Retrieved 06 March 2012, from <http://www.nsc.gov.ge/files/files/National%20Security%20Concept.pdf>

⁶ National Security Strategy of the United States of America. Retrieved 07 March 2012, from http://www.whitehouse.gov/sites/default/files/rss_viewer/national_Security_strategy.pdf

2. Problem Formulation

We live in a deeply developed and industrialized Era, the most developed it has ever been and that is especially true for those who live in the north hemisphere. At what cost? Which will be the repercussions of living in such a developed world?

All people should have Environmental security and be protected from ravages of nature (man-made or natural)⁷. What we can do to guarantee a greener future and to prevent the deterioration of the environment? The purpose of this thesis is to provide a well structured and innovative definition of the concept Environmental security and the path to a greener future.

In light of the above, my research questions are: **What is environmental security? How is it perceived? Can Environmental security guarantee a greener future?**

In order to define the environmental security concept, I started by defining the concept of Security, given that I believe that it is necessary to start with the fundamentals of a concept in order to achieve a broader concept. This thesis seeks to find the answer to the following key normative questions in order to find the answer to the main research question stated above:

- What is security? How do different scholars analyze the security concept?
- What is human security?
- How do international relations actors define environmental security?
- Do people consider environmental security important for their well-being?

⁷ Basic understanding on Human Security. Retrieved on 14 May 2012, from http://www.hsa-int.net/index.php?option=com_content&view=article&id=31&Itemid=59&8334001a37cb01e2392d29564433ac35=a7bdf5cfd7324e37b9b5be8b3e176ecf

3. Methodology

In this section, I will validate and explain my methodological considerations; the choice of subject; the structure of this thesis; the choice of sources and theory as well as my considerations regarding the philosophy of science and the ontological/epistemological considerations.

To employ in an accurate academic research on environmental security, it is necessary to develop an interpretive analysis of the security phenomenon. Theory is a vital element of this research work, since it provides the backcloth and the structure to a well develop conclusions. Concepts have a great value in this thesis, given that they are crucial to outline the key elements of the analytical framework. The objective of this work is to provide an academic research on environmental security, which will hopefully be useful for other academics and also for other international relations actors. However, methodology is also a large and important part of any research work. The methodological strategy used in this thesis to characterize environmental security and determine if it is possible to create a pathway for a greener future with effectiveness will be a mixed methods research strategy, combining quantitative and qualitative research.

This thesis will be divided into six different sections:

- I. Introduction – prologue of this thesis. It contains the evolution of the concept Security through the decades, since the most traditional views of the concept to a more contemporary view of the concept;
- II. Problem formulation – it is in this section that I define the purpose of this thesis, the theoretical and empirical contextualization and also the research questions that will serve as guidelines through this thesis;
- III. Methodology - guideline on how to execute the several sections on which the thesis is divided. In this section I will define my limitations; my choice and use of theory and I will also justify my choice of methods;

- IV. Theory – description of the existing theories on human security and environmental security. The purpose is to collect the most important theories on the two subjects from different actors with different perspectives on international relations and with that I will have the most possible information available about these topics. In this section, I will focus mainly in authors from the Welsh School of Security Studies and the Copenhagen School of Security Studies (for reasons that will be explained in chapter 3.3.). The temporal perception will follow the approach of historical development of the security concept in order to achieve a greater understanding of the historical constitution of the environmental security concept in the current international system;
- V. Analysis – review of the empirical data. It is on this section that my research questions (explained in the problem formulation) will be answered, with the help of the previously gathered and scrutinized theories connect the theory and data;
- VI. Conclusion – summary of findings and personal opinion about environmental security and the path to a greener future. Set of conclusion regarding environmental security based on the analysis I previously made.

3.1. Choice of Topic

I have chosen environmental security as the topic for this thesis. Because I consider environmental security to be an interesting field of Security Studies that has been over seen when compared to the traditional fields of security.

In 1994, human security was redefine, the Human Development Report made by UNDP expanded the definition of human: “the concept of security has for too long been interpreted narrowly: as security of territory from external aggression, or as protection of national interests in foreign policy or as global security from the threat of a nuclear holocaust. It has been related more to nation- states than to peoples”⁸. Further more on the same chapter, it is possible to analyze that seven new categories were considered to be a threat for human life: food security; economic security; health security; personal security; community security; political security and the one that this thesis will focus on – environmental security.

When environmental security cannot be guaranteed we assist to situations of environmental stress (pressure on the environment caused by human activities or by natural events⁹). These situations have several consequences in the world politics and in societies; they can for example, cause migrations; conflicts; health problems (physiological and psychological).¹⁰

⁸ Human Development Report 1994. Chapter 2

⁹ Environmental stress definition. Retrieved on 24 May 2012 from <http://www.businessdictionary.com/definition/environmental-stress.html>

¹⁰ Environmental stress. Retrieved on 25 May 2012 from <http://kungfu.psy.cmu.edu/~scohen/envirostress.pdf>

3.2. Choice of Sources

This section, explains my proceedings regarding the choice of sources and data collection. I will mainly use open sources in this research. My primary sources will consist in resolutions; agreements; reports; laws; along with other official State key documents that are decisive to make an accurate analysis on how States deal with Security questions. For my secondary sources, I will work with the existing literature dealing with the notion of security, human security and environmental security - as scientific articles, mainly on security studies; academic journals; academic and scientific research; periodicals and books. I will also collect data through on-line questionnaires, even with the short period of four months to write this thesis; I consider that a questionnaire will be a fundamental empirical data in order to analyze the perception people have on security matters and particularly on environmental security. Nonetheless, due to the limited time period I will not be able to make interviews to key policy makers – I find that this time limitation in a small extension affects one of the outcomes of this thesis (the peoples' perception on environmental security) since it would be important to compare and contrast the answers from the questionnaires and the opinion of key policy makers regarding the same questions. All in all, even with the time limitation, I believe that it is possible to write a high-quality thesis with the available sources and data.

I will be using, for both the theory and the analysis section of this thesis, computerized search engines (JSTOR; Project Muse; The Social Science Citation Index and the Expanded Academic ASAP) to find the scientific articles and I will be using standard computerized library catalogues and public libraries to find relevant books. I will also be using statistics and other relevant quantitative data from reliable open-sources. Ideally, I would like to analyze documents (e.g. records of meetings of the U.S. National Security Council; the British cabinet) recording the thinking of both key policy makers and political leadership within each country concerning environmental security. However, I am geographically and time limited and most of those documents cannot be accessed through the internet. Nevertheless, given that I cannot access the individual thinking of the policy makers, I will analyze the policies of some States - for a better understanding on their position regarding environmental security - I will analyze how some States define environmental security, by examining their official documents regarding the concept of National Security. These documents can be found on the countries official web-sites.

Concerning the questionnaire that I will make, it will be an on-line survey using the following steps:¹¹

- I. Defining the survey objectives – the perception people have on environmental security and how people perceive security in their lives;
- II. Type of data to be collected – quantitative and qualitative data with closed and open questions;
- III. Determining who will be sampled - the population of this questionnaire will be the global public opinion, regardless the age; sex; ethnicity; religion; political beliefs (without it being a random or quota sample); etc - therefore a convenience-based sample. However, this sample has a limitation: due to technical issues, only people with internet are able to respond;
- IV. Creating and testing the instrument – web survey with a Portuguese, a Spanish and an English version (three out of ten of the most spoken languages in the world¹²) so I can have a bigger sample. Some might consider web survey bias, however due to the time and geographic limitations and the fact that we live in a globalized world with 2,038,644,959.6 internet users in 2010¹³, I truly believe that the best way to conduct this questionnaire is by doing a web survey;
- V. Contacting respondents throughout the survey process – I will contact respondents through social media and also by sending requests by e-mail to NGOs; universities; international and national organizations with a cover letter and the website address;
- VI. Data collection – all the data collection will be done through the web survey that will transform the answers into a Microsoft Office Excel document;
- VII. Data reduction and analysis – I will standardize all the responses, so I can analyze the data in SPSS. In some cases, I will create graphs in order to make a better analysis of the data.

¹¹ Schonlau, M. Fricker, R. Elliott, M. (2002). *Conducting Surveys via E-Mail and the Web*. RAND. Santa Monica. Page 6

¹² Top ten languages most spoken in the world. Retrieved on 09 May 2012 from <http://exploredia.com/most-spoken-languages-in-the-world-2011/>

¹³ Internet users worldwide in 2011. Retrieved on 09 May 2012, from <http://search.worldbank.org/data?qterm=internet%20users&language=EN>

3.3. Choice of Theory

There are several European Security Studies Schools, each one offering a different contribution to the Security concept. Copenhagen School (Securitization), Aberystwyth or Welsh School (Critical Security Studies), Paris School (Sociological Work) and Third World Security School (emphasize in the Third World).

The Copenhagen School of Security Studies (normally linked to the work done by Ole Wæver and Barry Buzan) was formed in the Copenhagen Peace Research Institute. According to this School of thought, even though the military sector was incorporated in the security concept, it offers a different approach to security studies when compared to the traditional views on security. According to these scholars, other sectors should be included in security studies: economy, society, policy and the most relevant for this research environment. Barry Buzan considers that “security directs attention towards the need to find methods that can satisfy the legitimate concerns of states without at the same time amplifying the dynamics of insecurity among them”.¹⁴ To him, after the Cold War, security was seen as a vehicle to achieve freedom from threats and also to protect States against hostile forces.¹⁵

The Welsh School of Security Studies, (normally linked to the work done by Ken Booth; Mike Williams; Keith Krause and Richard Wyn Jones) relies on the knowledge from the Frankfurt School and the Gramscian thinking - linking security to critical theory with the individual in the heart of their analysis - critical security studies argue that States contribute negatively to the world’s security, being the problem instead of the solution. The Welsh School “works within the tradition of critical theory, a critique of the modernist meta-narrative of rational social/political theory”¹⁶. According to Richard Wyn Jones, critical security studies “not only encourages the development of a more analytical conceptualization of security but also generates a more sophisticated framework for the analysis of military force (strategy) than that utilized by

¹⁴Buzan, B. (1984). *Peace, Power, and Security: Contending Concept in the Study of International Relations*. Journal of Peace Research.Vol. 21.No. 2. Page 112

¹⁵Buzan, B. (1991). *New patterns of global security in the twenty-first century*.International Affairs.Vol. 67.Iss. 3. Page 432

¹⁶Floyd, R. (2007). *Towards a consequentialist evaluation of security: bringing together the Copenhagen and the Welsh School of security studies*. Review of International Relations.Vol. 33.Iss. 2. Page 330

traditional security studies.”¹⁷ Ken Booth, advocates that individuals have constitutive relationships with the society, the world politics cannot be studied without having in consideration that there are a plurality of actors that affect the major global issues, “the power-political emphasis on conflictual interactions should be readdressed in favor of emphasizing all significant interactions, including networks of cooperation (...) power should not simply be reduced to material factors”¹⁸ the author goes further and includes the care for the environment as a key order value.

The Paris School of Security Studies has great influences from the Post-Modernist Michel Foucault and BigoBoursieu work in the journal *Cultures & Conflicts*. According to Ole Wæver the Paris School has its roots in political theory, policing in Europe and the sociology of migration (contrary to the other schools that have roots in international relations). The Paris School “has the great advantage of being able to keep up with a society increasingly characterised by professionalisation and technical rationalisation, where specific social positions are privileged in relation to ‘doing security’.”¹⁹

The Third World Security School is more concerned with security issues in developing countries (also known after the Cold War as the Third World) – Caroline Thomas had a great influence in this School when she wrote the book *In Search of Security: the Third World in International Relations* (1987), changing the traditional analysis of security issues.

This thesis will focus mainly on the work writing by authors from the Welsh School and the Copenhagen School. This decision was made after a scrupulous analysis of the Security Studies Schools and based on the fact that these two Schools are more appropriate to study of environmental security. The Welsh School and the Copenhagen School are the ones that come closest to my personal understanding on Security. The Copenhagen School of Security Studies is of interest in this thesis, because it allows the analysis on security studies to include the weight that the environment – this school, as mentioned before includes a variety of sectors in the study of security, such as the economy, society, policy and environment. The Welsh School of security

¹⁷ Jones, R. (1999). *Security, strategy, and Critical Theory*. Lynne Rienner Publishers, Inc. London. Page 94

¹⁸ Booth, K. (2007). *Theory of World Security*. Cambridge University Press. New York. Page 64

¹⁹ Wæver, O. (2004); *Aberystwyth, Paris, Copenhagen New Schools in Security Theory and their Origins between Core and Periphery*. Paper presented at the annual meeting of the International Studies Association, Montreal, March 17-20, 2004

studies is of interest, because contrary to traditional schools of security, does not focus on the states, but as I mention before, on the individual. Both these schools have a more contemporary views regarding Security - combining military power with other important features of security and giving some power to the individual instead of giving more power to the States.

I will use the influence of these theories to analyze the collection of my data. I will follow the Copenhagen School and the Welsh School of security studies as a guideline of how security and environmental issues should be analyzed: having in consideration not only how environmental security affect military issues (i.e. conflicts); but also how environmental security affects the society, politics, economy and the individual.

In this globalized world that we live in, where everything is connect, the Security concept is not an exception; therefore it cannot be analyzed as it was between the post-Westphalia and the Cold War when hard power²⁰ was the most important feature of Security - it has to be analyzed having in consideration the hard power combined with the soft power²¹, using a smart power approach. A smart power is approach is “neither hard nor soft—it is the skillful combination of both. Smart power means developing an integrated strategy, resource base, and tool kit to achieve ”.”²²

²⁰ Hard power is the use of influence in order to draw people to our side through coercion (military and economic)

²¹ Soft power is the ability to draw people to our side without coercion. Legitimacy and diplomacy are key to soft power.

²² Center for Strategic and International Studies. Retrieved 14 May 2012, from http://csis.org/files/media/csis/pubs/071106_csissmartpowerreport.pdf

3.4. Philosophy of Science

I will analyze the empirical evidences using a mixed-methods research. “Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purpose of breadth and depth of understanding and corroboration”²³ – I will use the Hammersley triangulation approach, a combination between qualitative research and quantitative research, which occurs when quantitative research is used to “corroborate qualitative research findings or vice versa”²⁴ reducing inappropriate generalizations²⁵. Qualitative research will provide me an inductive assessment of the relationship between theory and research - , while the quantitative research will provide me a deductive assessment of the relationship between theory and research - I will deduce a hypothesis to be subjected to empirical analysis “on the basis of what is known about a particular domain and of theoretical considerations in relation to that domain.”²⁶ I decide to choose triangulation as a mixed research method, because of the idea behind triangulation that “by drawing data from sources that have very different potential threats to validity, it is possible to reduce the chances of reaching false conclusions”.²⁷

Concerning the epistemological considerations, this thesis follows an interpretivism methodology. I seek to develop a research through the examination of main ideas, rules and discourses; in this thesis, the interpretation of people’s opinions and human behavior is important, since environmental related policies are made by people for the people. My main goal in to “attempt the interpretive understanding of social action in order ot arrive at a casual explanation of its course and effects”.²⁸

²³ A brief history of mixed methods – multiple method beginnings. Retrieved on 14 May 2012 from <http://www.leeds.ac.uk/educol/documents/174130.pdf>

²⁴ Bryan, A. (2008). *Social Research Methods*. Oxford University Press. 3rd edition. New York. Page 607

²⁵ A brief history of mixed methods – multiple method beginnings. Retrieved on 14 May 2012 from <http://www.leeds.ac.uk/educol/documents/174130.pdf>

²⁶ Ibid. Page 9.

²⁷ Bergman, M. (ed.). (2008). *Advances in Mixed Methods Research: Theories and Applications*. Sage Publications. Wiltshire. Page 24

²⁸ Bryan, A. (2008). *Social Research Methods*. Oxford University Press. 3rd edition. New York. Page 15

4. Theory

In order to analyze the concept of environmental security and the pathway to a greener future, it is fundamental to comprehend the foundation and foremost characteristic of the theory.

4.1. Security

Security issues have always been a constant in the national and international agenda. However, the connotation of the word security “has changed continually over time”²⁹. During Napoleonic Wars in Europe, security was seen as the main objective of States and it was to be achieved by all means necessary (diplomatic or military).³⁰ In the twentieth Century, the meaning was extended, to also include “protection against sudden or violent deterioration in the standard of living of individuals”³¹ – security was no longer seen as an objective to be achieved exclusively by the States, to improve States strength, but also an objective to be achieved by the States to ensure the individuals well-being.

Different international relations paradigms have different interpretations of security. Hans Brauch makes a distinction of the security concept between the Social Constructivist and Realism perspectives - for the Social Constructivists, “Security is conceived as an outcome of a process of social and political interaction where social values and norms, collective identities and cultural traditions are essential”³²; for the realists, “Security is achieved when the danger posed by manifold threats, challenges, vulnerabilities and risks are avoided, prevented, managed, coped with, migrated and adapted to by individuals, societal groups, the state or regional or global international organizations”³³.

²⁹Rothschild, E. (2007). *What is Security?*. In Buzan, B. Hansen, L. (eds). *Widening Security*. International Security. Volume III. Sage Publications. London. Page 7

³⁰ Ibid.

³¹ Ibid. Page 8

³² Brauch, H. (2011). *Concept of Security, Challenges, Vulnerabilities and Risks*. In: Brauch et al. (Eds.). *Threats, Challenges, Vulnerabilities and Risks*. 1st Edition. Series: Hexagon Series on Human and Environmental security and Peace. Vol. 5. Springer. Berlin. Page 61

³³ Ibid.

There are two main approaches on security studies that differ on the view of the security scope, the Traditionalist approach and the Wide approach. The first approach, the Traditionalist stresses the importance of the military sector and the territorial integrity of sovereign States, this approach is normally associated with realism. Traditionally, security is concerned with the territorial integrity of sovereign States - military power is used by States to ensure the defense of their territory.

Wheeler and Booth consider that “stable security can only be achieved by people and groups if they do not deprive others of it; this can be achieved if security is conceived as a process of emancipation”.³⁴ This new perception of security where ethno-national groups should be the core of Security instead of States, was materialized after the Cold War when the fragmentation of several States, like the Soviet Union and the Yugoslavia, lead to the emergence of minorities.³⁵

The Wide approach on security studies, combines both traditional and new security issues/threats, such as “new form of nationalism, ethnic conflict and civil war, information technology, biological and chemical warfare, resource conflicts, pandemics, mass migration, transnational terrorism and environmental dangers challenge the conventional mean of understanding threats and of assuring security.”³⁶

Barry Buzan and Ole Wæver from the Copenhagen School on Security Studies, established in 2009, a new security related concept – macrosecuritization. The aim was to provide a tool to analyze securitization at a global level; the need for this concept has to do with the emergence of global security issues, such as, for example, international terrorism. Securitization is the “the social processes by which groups of people construct something as a threat.”³⁷ Securitization is

³⁴ Wheeler, N. J.; Booth K. (1992). *The Security Dilemma*. In Baylis J. and. Rengeer N.J (eds), *Dilemmas of Worlds Politics: International Issues in a Changing World*. In Baylis J. Smith S. Owens P. (eds)*The Globalization of World politics: An Introduction to International Relations*. Oxford University Press. Oxford. Page 229

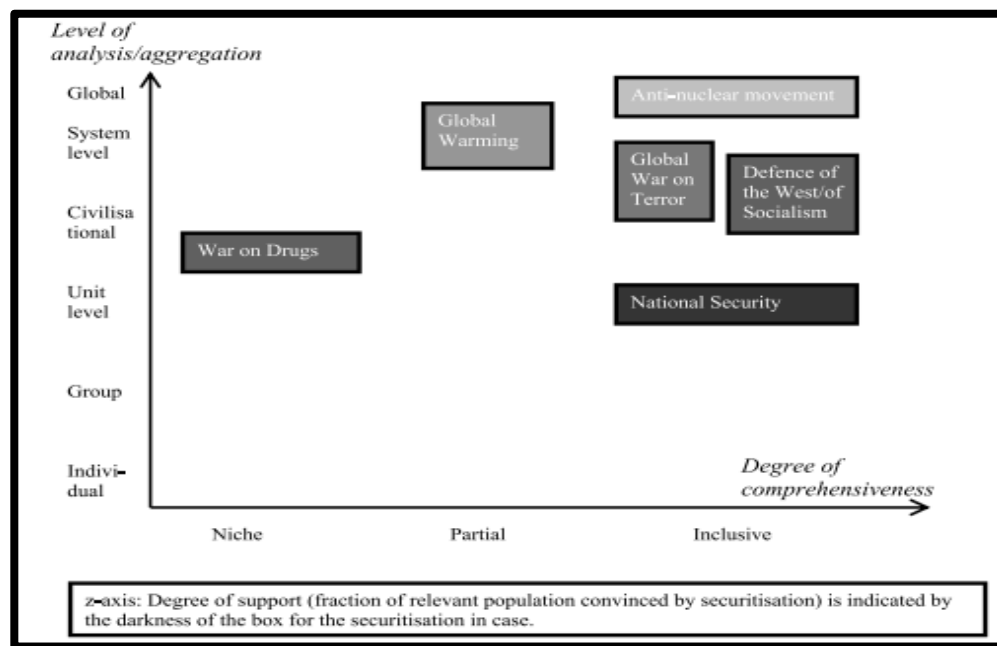
³⁵ Baylis J. Smith S. Owens P. (eds)*The Globalization of World politics: An Introduction to International Relations*. Oxford University Press. Oxford. Page 229

³⁶ New Security Studies, PRIO. Retrieved on 14 May 2012 from <http://www.forskningssradet.no/servlet/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobheadername1=Contentdisposition%3A&blobheadervalue1=+attachment%3B+filename%3DPNSS.pdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1274460400663&ssbinary=true>

³⁷ Buzan, B. Hansen, L. (2009) *The Evolution of International Security Studies*. Cambridge University Press. Cambridge. Page 37

successful achieved when “the security act is negotiated between securitizer and audience”³⁸ and the securitizing act is accepted by the audience. The perception of a threat leads to reactions from key decision making actors, which have the aptitude to mobilize a reaction aiming at securitizing the initial threat after receiving approval from an audience, however until and unless the audience approves, they will just be engaging in a securitizing move. There are three components that assure a successful securitization: existential threats; emergency action and effects on inter-unit relations by breaking free of rules and procedures.³⁹ Macrosecuritization, shares the same characteristics as securitization and it follows the same system, identification of an existential threat to an object and the call for necessary measures⁴⁰. However, it aims for “top-rank threats”⁴¹ such as geo-economics; terrorism and nuclear proliferation instead of middle level threats such as religions ore political ideologies⁴². As a result of macrosecuritization having both higher and lower level of securitizations, there are “permanent tensions across the levels”⁴³.

Figure 2: The Three Dimensions of Macrosecuritization: Comprehensiveness, Level; degree of support.
Source: Buzan, B. Wæver, O. (2009) Page 259



³⁸ Buzan, B. Wæver, O. Wilde, J. (1998). *Security: A new Framework for Analysis*. Lynne Rienner Publishers. Colorado. Page 26

³⁹ Ibid.

⁴⁰ Buzan, B. Wæver, O. (2009) Macrosecuritization ad security constellations: reconsidering scale in securitization theory. *Review of International Studies*. Issue 35. British International Studies Association. Page 257

⁴¹ Ibid. Page 259

⁴² Ibid. Page 257

⁴³ Ibid.

Figure 2 represents the three dimensions of macrosecuritization. The x-axis is the degree of comprehensiveness: niche; partial or inclusive; the y-axis is the level of analysis/aggregation: individual, group, unit level, civilizational, system level and global – universal; the z-axis is the degree of successes in terms of convincing proportions of the relevant audience. War on drugs is considered a middle level and it is not comprehensive, “it does not structure securitization in other spheres”⁴⁴. Global Warming is characterized at a global level of analysis and it has a partial degree of comprehensiveness; however this situation “could change rapidly if it becomes a unified global object of concerted action with security-style urgency.”⁴⁵ Anti-nuclear movements have an inclusive degree of comprehensiveness in a global level of analysis, however they are low in the degree of support, because they “only convinced a minority of the relevant audience and did not succeed in underpinning decisive actions transforming its object of concern.”⁴⁶ Global war on terror and defense of the West/of Socialism have an inclusive degree of comprehensiveness in a system/civilisational level of analysis and they have the support of a fraction of relevant population. National security, however has the highest degree of support from the fraction of relevant population and it is inclusive in the degree of comprehensiveness at a unit level of analysis, “the ‘national’ security problem turns out to be a systemic security problem in which individuals, states and the system all play a part, and in which economic, societal and environmental factors are as important as political and military ones.”⁴⁷

⁴⁴ Buzan, B. Wæver, O. (2009) Macrosecritization and security constellations: reconsidering scale in securitization theory. *Review of International Studies*. Issue 35. British International Studies Association. Page 258

⁴⁴ Ibid.

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ Buzan, B. (1991). *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*. 2nd Edition. Harvester Wheatsheaf. Hertfordshire. Page 368

4.2. Human Security

This chapter will explain the concept of human security. It is important to define this concept before defining the concept of environmental security, since this last one should be an extension of first one, given that environmental security affects directly (positively or negatively) the lives of many human beings and as a consequence their security.

With the end of the Cold War the concept of Human Security materialized. It was the year of 1989, the Berlin Wall had just fall and the world was changing in terms of national and international politics; economics and culture. It was from this moment onwards, that human security begun to be a constant in the international agenda. When the Human Development Report was published, one could read “the basic objective of development is to create an enabling environment for people to enjoy, long healthy and creative lives”⁴⁸ and also “people are the real wealth of a nation.”⁴⁹ The center of the Human Security concept is the people and their well-being instead of institutions – the Human Security concept, contrary to the traditional security concept, places the individual as the priority, instead of the State.

The Commission on Human Security defines human security as “the protection of the vital core of all human lives in ways that enhance human freedoms and fulfillment (...) creating political, social, environmental, economic, military and cultural systems that when combined, give people the building blocks of survival, livelihood and dignity”.⁵⁰ There are ways to *enhance human freedoms and fulfillment* by reducing the threats to which people are subjected. These threats reductions can be done in several areas that influence human life: food security; economic security; health security; personal security; community security; political security and environmental security.⁵¹

⁴⁸Human Development Report 1990. Retrieved on 02 Apr 2012, from http://hdr.undp.org/en/media/hdr_1990_en_chap1.pdf.

⁴⁹ Ibid.

⁵⁰ United Nations trust fund for Human Security. Human Security concept. Retrieved on 10 Apr 2012, from <http://www.ochaonline.un.org/Default.aspx?alias=ochaonline.un.org/humansecurity>

⁵¹ The seven dimensions of human security

Two different approaches regarding human security have stood out among many of existing human security approaches. The first one, “freedom from fear”⁵² argues that human security should be limited to the protection of individuals from violent conflict and violent threats concerning their rights; safety and lives. The second approach, “freedom from want”⁵³ argues that the human security agenda should include hunger; diseases and natural disasters, since it considers these to be the origins of human insecurity. However these are not the only approaches to human security.⁵⁴

The concept of human security formulated by UNDP has been criticized by many traditionalist academics. Some of those, as Gary King and Christopher Murray consider it to be “too broad to be useful as a construct for security or foreign policy.”⁵⁵ Gary King and Christopher Murray consider that when a human being is in a state of “generalized poverty”, he is in a state of human insecurity. In their article *Rethinking Human Security* for Political Science Quarterly, they define the two key elements of Security: “an orientation to future risks and a focus on risks of falling below some critical threshold deprivation”⁵⁶. Security cannot only be measured according to how well a State is responding to the present needs of its inhabitants, but rather how well will a State response to future needs. States cannot be vulnerable to unforeseen internal or external tribulations.

⁵² Basic understanding on human security. Retrieved on 14 May 2012 from http://www.hsa-int.net/index.php?option=com_content&view=article&id=31&Itemid=59&8334001a37cb01e2392d29564433ac35=a7bdf5cfd7324e37b9b5be8b3e176ecf

⁵³ Basic understanding on human security. Retrieved on 14 May 2012 from http://www.hsa-int.net/index.php?option=com_content&view=article&id=31&Itemid=59&8334001a37cb01e2392d29564433ac35=a7bdf5cfd7324e37b9b5be8b3e176ecf

⁵⁴ Ibid.

⁵⁵ King, G. Murray, C. (2001/2002). *Rethinking Human Security*. Political Science Quarterly. Vol. 116. Iss. 4. Page 585

⁵⁶ Ibid.

4.3. Environmental Security

This chapter explores the origins of the theory behind the environmental security concept.

The rapid technological advances; increasing economic interdependences; globalization and geopolitical changes, reinforced concepts such as development; security and human rights, as well as the link between them.⁵⁷ The concept of security is no longer the same as the one before the Cold War, if before security was associated with war and hard power⁵⁸, nowadays security is also associated with the quality of one's life and environment security influences that quality. According to Barry Buzan, insecurity rose exponentially during the Cold War decades due to the introduction of nuclear power in the warfare. He considers modern Era wars to be more dangerous than traditional ones, because in modern Era wars, "humankind holds the capability for species suicide for the first time in history."⁵⁹

In previous chapters the concept of security has been defined, however it is still necessary to define what is environment. According to the UNEP 2009 report on conflict and peacebuilding, "environment is the sum of all external conditions affecting the life, development and survival of an organism (...) it refers to the physical conditions that affect natural resources (climate, geology, hazards) and the ecosystem services that sustain them (e.g. carbon, nutrient and hydrological cycles)."⁶⁰

Environmental security gradually became noteworthy in security issues, due to the emergence of new contemporary threats, such as the increase of world population, water scarcities, groundwater depletion, degradation of arable land, loss of tropical forests, substantial increases of greenhouse gas emissions (GHG), exacerbation of biological species loss, rapid urbanization, air and water quality problems, glacial ice melts, sea level rise and the increase of storm frequency. Environmental security is associated with environmental threats as deprivation, degradation and scarcity of resources and it can be seen as the preservation of the individual's

⁵⁷ *In larger freedom; Towards Development, Security and Human Rights for All*. (2005). Report of the secretary-General of the United Nations. United Nations; New York. Page 6

⁵⁸ Military power; power of economic coercion.

⁵⁹ Buzan, B. (1984). *Peace, Power, and Security: Contending Concept in the Study of International Relations*. Journal of Peace Research. Vol. 21. No. 2. Page 112

⁶⁰ From Conflict to Peacebuilding. The Role of Natural Resources and the Environment. UNDP. 2009

interests in regard to nature and the prevention of natural threats and disasters. Its goals are “repairing damage to the environment for human life support and for moral value of the environment itself; and, preventing damage to the environment from attacks and other forms of human abuse.”⁶¹

Environmental sustainability entails a long-term viability of the natural resources. When the natural resources are not preserved, it may lead to an ecological crisis.⁶² Ecological crises have been happening for a long time in different places of the world, an example of one of the many ecological crises, is the oil spills. In 1989 there was the Exxon Valdez oil spill in the coast of Alaska; in 1986 there was nuclear meltdown at Chernobyl; recently in 2010 there was the Deepwater Horizon oil spill in the Gulf of Mexico. A diversity of ecological men caused crises along with the ones caused by nature, led to a worldwide environmental degradation.

Figure 3: Oil spill
Source: Oil Spill News



Scheffran made an analysis of the casual relationship between climate change; natural resources; human needs and societal instability (figure 3). According the following figure produced by Scheffran, climate change; natural resources; human needs and societal instability are connected. Climate change causes stress to natural resources and that has an impact on human needs that in response causes societal instability. In order to mitigate the stress caused by the relationship between climate change and natural resources, it is necessary to develop and invest in energy technology. The impact of the relationship between natural resources human needs causes vulnerability; therefore it is necessary to create economic production. It is necessary to create strategies and institution for a better adaptation of the response human needs have on societal instability. The author gives a practical example of the casual relationship between climate change; natural resources; human needs and societal instability: “desertification caused by

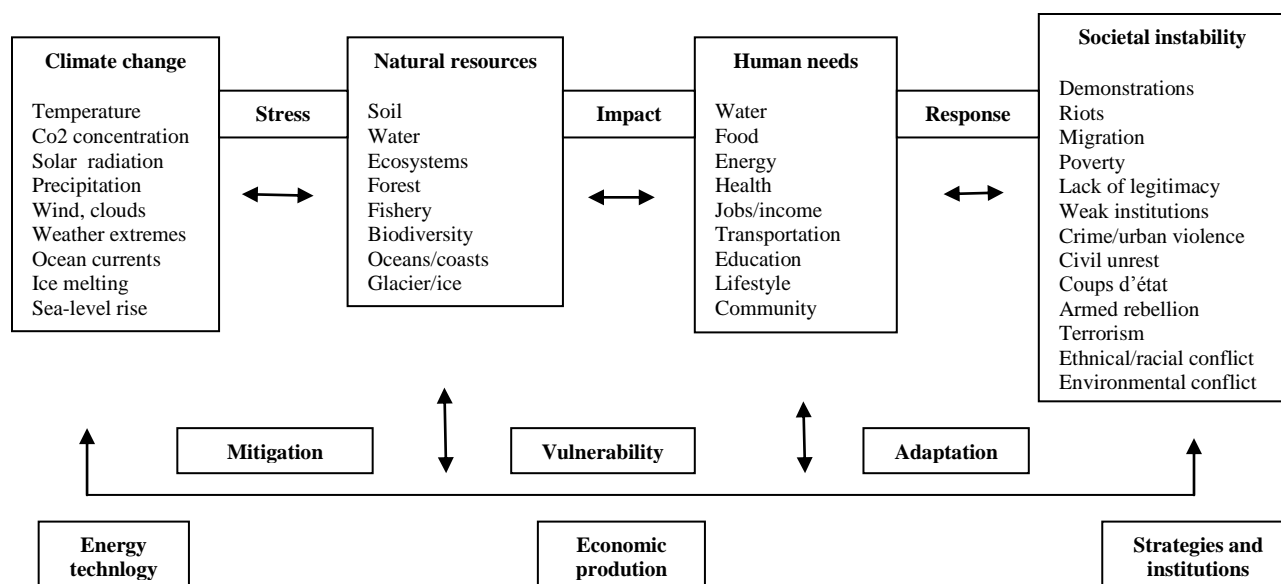
⁶¹ Morel, B. Linkov, I. (2006). *Environmental security and Environmental Management: The Role of Risk Assessment*. NATO Security through Science Series; Page 4

⁶² Edwards, A. (2005). *The Sustainability Revolution—Portrait of a Paradigm Shift*. New Society Publishers. Gabriola Island. Canada. Page 21

climate change may undermine food security and force people to migrate or take violent actions”⁶³. All in all, “since human societies rest on certain environmental conditions, a changing climate that significantly alters these conditions will cause stress to social systems and had an impact on human life and society. Whether societies are able to cope with the impacts will depend on their responses to change and their abilities to adapt to or solve associated problems.”⁶⁴

Figure 4: Causal relationship between climate change, natural resources, human needs and societal impacts.

Source: Scheffran, J. (2011) Page 736



A report published by the Peace Research Institute Oslo (PRIO) and the Fridtjof Nansen Institute (FNI) divides environmental and security research in three generations. The first one “refers to an ongoing interdisciplinary debate in the academic and political community on whether and how environmental issues should be incorporated in security concerns”⁶⁵ traditionalists fear that by introducing environmental issues to the security concept, this last one becomes too broad. The second generation emerges in the beginning of the 1990’s as a criticism to the first generation and to the traditionalists. The third generation emerged in the mid 1990’s in order to

⁶³ ⁶³ Scheffran, J. (2011). *Security Risks of Climate Change: Vulnerabilities, Threats, Conflicts and Strategies*. In: Hexagon Series on Human and Environmental security and Peace. Vol. 5. Springer. Berlin. Page 737

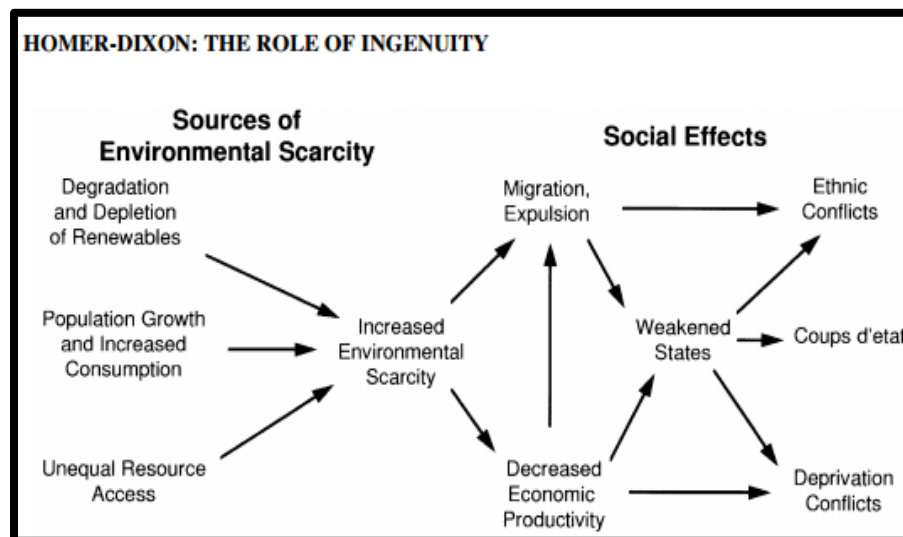
⁶⁴ Ibid. Page 736

⁶⁵ Homer-Dixon, T. (1996). *The Project on Environment, Population and Security: Key Findings of Research*. Environmental Change and Security Report, 2. Page 48.

include in the researches on environment cases of cooperation and also as criticism to the approach of the Toronto Group⁶⁶ the Toronto Group argued that environmental scarcity “rarely contributes directly to interstate conflict”⁶⁷.

Homer-Dixon enumerated six different kinds of environmental scarcity that might lead to violent conflict: Greenhouse effect; degradation and loss of good agricultural land; stratosphere ozone depletion; degradation and removal of forests; depletion of fisheries; depletion and pollution of fresh water supplies. After analyzing 15 case studies in India, Middle East; Mexico; among other places worldwide, Homer-Dixon created a model linking environmental scarcity and conflict. He considers degradation and depletion of renewable resources (cropland; forest supplies; water supplies); population growth and increased per-capita resource consumption (increase demand for the resource) and unequal resource access (some people have a larger access to the resources, than others) the sources of environmental scarcity. The increases of environmental scarcity will, according to him have social effects (migration; decreased economic productivity; weakened states) that will result in ethnic conflicts; coup d’état and deprivation conflicts.⁶⁸

Figure 13: Model linking environmental scarcity and conflict.
Source: Homer-Dixon, T. (2006)



⁶⁶ Conflict researchers at the Toronto University

⁶⁷ Ronnfeldt, C. (197) *There Generations of Environmental and Security Research*. Journal of Peace Research. Vol. 34. No. 4. Page 473

⁶⁸ Homer-Dixon, T. (2006) *Population, Environment, and Ingenuity*. Annals of the New York Academy of Science. Vol. 882. Iss. 1. Page 209

Environmental degradation and scarcity of resources have serious repercussions in human health and in societies, when communities are at risk they become more vulnerable to external and internal threats and that may lead to conflict. However the abundance of natural resources may also lead to conflict over the control of resources.⁶⁹

Jon Barnett and Neil Adger claim, that conflict might be stimulated by climate change in two broad ways. The first is based on an idea that “conflict could come through changes in the political economy of energy sources due to mitigative action to reduce emissions from fossil fuels”⁷⁰ and according to the second idea, conflict is “stimulated by changes in social systems driven by actual or perceived climate impacts.”⁷¹

Environmental cooperation can be the solution to minimize the vulnerabilities caused by environment insecurity. Environmental cooperation can happen at an international level or at a sub-regional level. At the international level, the main outcome of the cooperation is represented through multilateral treaties focus on mitigating the climate change effects. At a sub-regional level, the cooperation is translated into the conservation of transboundary areas and the equitable sharing of natural resources, for example regional seas and shared water resources.⁷²

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⁶⁹ Human Dimension of Environmental Change. Retrieved on 30 May 2012 from http://www.unep.org/geo/geo4/report/07_Vulnerability_of_People.pdf. Page 316

⁷⁰ Barnett, J. Adger, N. (2007). *Climate Change, human security and violent conflict*. Political Geography. Iss. 26. Elsevier. Page 640

⁷¹ Ibid.

⁷² Ibid. Page 348

5. Analysis

Five areas related to environmental security will be analyzed in the following pages. These areas were chosen due to the influence they have on environmental security:

- 5.1. **Energy** – if before humankind was able to survive without energy, without electricity, nowadays it cannot. The question is what type of energy should be used;
- 5.2. **Climate Change** – human beings are continually being affected by climate change, either do to the increase of temperatures, or the melting of the glaciers or other climate change repercussions. These threats are a constant danger to the human being wealth and well-being ;
- 5.3. **Insecurity and Conflicts** – resources scarcity and environmental degradation are responsible for conflicts, migrations affecting the quality of human life's;⁷³
- 5.4. **Institutionalization of the environment** – environmental security has been the focus of several agreements bilateral and multilateral;
- 5.5. **Environmental Perception** – people are as important to environmental security as government, hence, the perception people have regarding the environment is essential to either improve it or to deteriorate it.

This chapter will focus on how energy is being produced and on how climate change might lead to insecurity and conflict. This chapter will also focus on the outcomes of the environmental agreements and the cooperation between different actors regarding environmental security and also on the perception people have regarding the environment and the pathways to shape a greener future.

⁷³ Environmental degradation as a cause of conflict. Retrieved on 24 May 2012 from http://www.upeace.org/library/documents/darfur_cp.pdf

5.1. Energy Demand

Energy demand over the world has been increasing in the past decades, either due to the population growth or due to the economic development.⁷⁴ This increase of demand is particular visible in new industrialized countries, such as the BRICs⁷⁵. This section will focus on the importance of energy, but also on the importance of renewable energy.

Energy security may be defined as “the need to secure sufficient supply at reasonable price for energy.”⁷⁶ Energy can be obtained from fossil fuels; biomass; nuclear power; hydroelectric generation and other renewable sources. In 2008 a total of 20,181 TWH⁷⁷ of energy were produced around the world.

Different types of energy have different impacts in the volume of greenhouse gas emissions.⁷⁸ Electricity produced from fossil fuels has a higher impact on GHG emissions than electricity produced from renewable sources. This occurs with transportation as well, vehicles powered by oil produce more GHG emissions than vehicles powered by electricity. A perfect combination to reduce GHG emissions would be to power vehicles with energy from renewable resources. “A natural resource qualifies as a renewable resource if it is replenished by natural processes at a rate comparable to its rate of consumption by humans or other users. A natural resource is considered non-renewable when it exists in a fixed amount, or when it cannot be regenerated on a scale comparative to its consumption.”⁷⁹

In graphs 1 to 13⁸⁰ it is possible to observe that energy production has suffered significant changes in the past decades. While in OECD countries,⁸¹ particularly in Europe, the energy

⁷⁴ Center for Strategic and International Studies. Retrieved 14 May 2012, from http://csis.org/files/media/isis/pubs/071106_csissmartpowerreport.pdf.

⁷⁵ Brazil; Russia; India; China.

⁷⁶ Palonkorpi, M. *The Energy Security Complex - Energy Security and the Regional Security Complex Theory Energy security*. Aleksanteri Institute. University of Helsinki.

⁷⁷ *Global Report on Human Settlements 2011- Cities and Climate Change* (2011). UN-HABITAT. Earthscan. London. Page 38.

⁷⁸ Ibid. Page 39.

⁷⁹ *From Conflict to Peacebuilding. The Role of Natural Resources and the Environment*. UNDP. 2009

⁸⁰ Available in appendix I.

production has decreased since the mid 1990's with drastic decline in Germany, from more than 200 Mtoe⁸² in 1985 to less than 150 Mtoe from 1995 onwards. In the United Kingdom, the production fluctuated a lot, reaching two peaks: one in 1992 and another in 2000 with almost 300 Mtoe, however it had a rapid decline since the beginning of the century reaching less than 200 Mtoe in 2009. In non OECD countries, the energy production has increased, particularly in Brazil, where it fivefold from 5,0000 Ktoe⁸³ in 1971 to almost 250,000 in 2009. In China the production of energy increased from almost 500 Mtoe in 1971 to 2000 Mtoe in 2009. In India the production of energy rose from almost 150 Mtoe in 1971 to more than 500 Mtoe in 2009.⁸⁴ All in all, even with the decrease of the energy production in OECD countries, energy production has increased in the past decades. This is understandable, considering that in 2002 the final consumption expenditure in the world was US\$ 26,329,047,409 and in 2010 it increased to US\$ 48,398,397,717.⁸⁵ If consumption levels increase, energy production also increases. What are the solutions to maintain the consumption levels that populations are use to have and at the same time reduce our energy dependence?

Denmark seems to have found a new energy strategy that promises to have all Danish energy supply (electricity; heating; industry and transport) coming from renewable sources by 2050, but not without a price, it is estimated that the transition will cost DKK 5.6 billion (US\$ 959, 3304 million).⁸⁶ This program that was approved by the Danish parliament in March 2012 has a 50% wind penetration target, but it also includes biogas; geothermal heat pumps; biofuels and a comprehensive approach combining heat and power.⁸⁷ Although the independence from coal, oil and gas are the main goals of the Danish government, this strategy will also ensure energy security, by ensuring stable, affordable energy supply and “contribute to limiting global climate

⁸¹ Australia; Austria; Belgium; Canada; Chile; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Israel; Italy; Japan; Korea; Luxembourg; Mexico; Netherlands; New Zeland; Norway; Poland; Portugal; Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Turkey; United Kingdom and United States.

⁸² Million Tons of Oil Equivalent

⁸³ Kilo Tons of Oil Equivalent

⁸⁴ International Energy Agency, Energy production. Retrieved on 15 May 2012 from <http://www.iea.org/stats/graphsearch.asp>

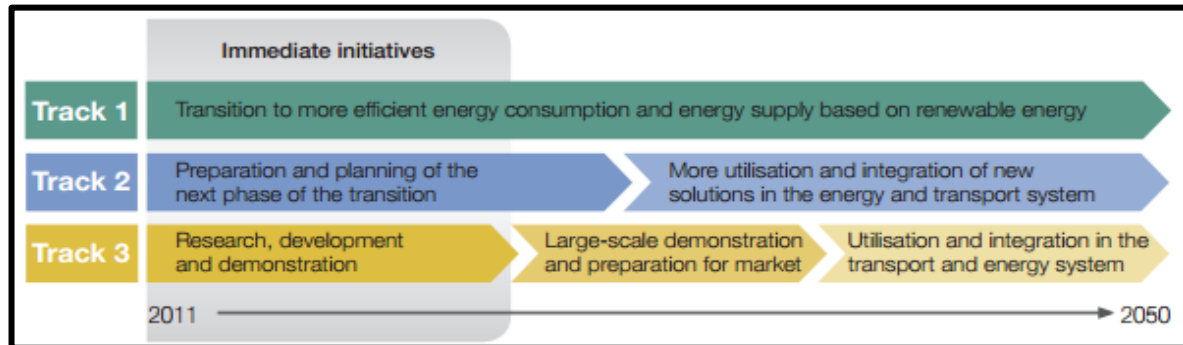
⁸⁵ Final consumption expenditure in US \$. Retrieved on 16 May 2012 from http://search.worldbank.org/quickview?name=Final+%3Cem%3Econsumption%3C%2Fem%3E+expenditure%2C+etc.+%28current+US%24%29&id=NE.CON.TETC.CD&type=Indicators&cube_no=2&qterm=consumption

⁸⁶ International Energy Agency commends new Danish energy strategy. Retrieved on 16 May 2012 from <http://www.iea.org/newsroomandevents/pressreleases/2012/february/name,20324,en.html>

⁸⁷ Dk energy agreement, March 22 2012. Retrieved on 16 May 2012 from <http://www.kemin.dk/Documents/Presse/2012/Energiaftale/FAKTA%20UK%201.pdf>

change as agreed in Copenhagen 2009 and in Cancún 2010.”⁸⁸ Some might say that one country alone cannot change the world or cannot limit the global climate change effects, however this types of initiatives are important because other countries will have a role model and they will know that it is possible to make a complete transition from non-renewable to renewable sources of energy.

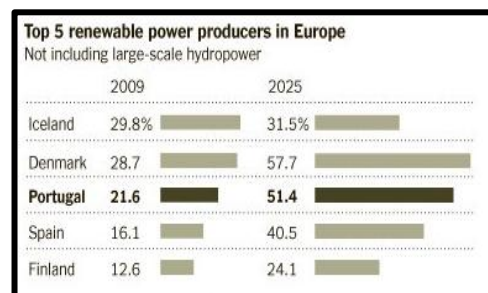
Figure 4: Illustration of the three tracks in Danish strategy to use only renewable energy by 2050.
Source: <http://www.kemin.dk/Documents/Presse/2012/Energiaftale/FAKTA%20UK%201.pdf>



The previous figure, explains the three tracks⁸⁹ Danish government is using to enforce their new energy strategy. The first one, the transition track; the second one, is the planning and preparation track; the third one, is the technology development track.

Denmark and Portugal were in 2009 the second and the third (respectively) renewable power producers in Europe. However it is expected that by 2025 they will be the first and the second (respectively) and the only two countries in Europe with more than 50% of renewable power production (when ignoring hydro power).⁹⁰

Figure 5: Top 5 power producers in Europe.
Source: HIS Emerging Energy Research



Portugal has also been shaping new clean energy strategies, exploiting the country’s wind; hydropower; sunlight and ocean waves. In 2008 the world’s first wave farm⁹¹ – Aguçadoura Wave Farm – officially opened 5 km offshore in the north of Portugal. This farm uses three

⁸⁸ Dk energy agreement, March 22 2012. Retrieved on 16 May 2012 from <http://www.kemin.dk/Documents/Presse/2012/Energiaftale/FAKTA%20UK%201.pdf>.

⁸⁹ Ibid.

⁹⁰ HIS Emerging Energy Research. Retrieved on 16 May 2012 from <http://www.emerging-energy.com/>

⁹¹ Collection of machines in the same location and used for the generation of wave power electricity.

Pelamis wave energy converters in order to convert the motion of the ocean surface waves into electricity.⁹² Also in the north of the country, it is possible to find a wind farm composed by 120 windmills.⁹³ In the south of the country, it is possible to find the world's largest solar photovoltaic farm, with 2520 giant solar panels, tracking the sun through 240 degrees every day and supplying 45 MW a year.⁹⁴ Portugal also possesses a dense network of charging stations composed by 1350 spots in several cities across the country, where it is possible to charge electrical vehicles.⁹⁵

Portugal and Denmark are not similar at all in its geography; society; economy; education; etc. Nevertheless, both of them are building paths to a greener future by investing in renewable sources of energy and as a consequence, they will not only be improving their environmental security, but also assuring their energy independence. If two countries that are so different from each other are able to have such innovative green policies regarding energy supply, more countries will certainly be able to do the same.

⁹² Wave energy to power Portugal. Retrieved on 16 May 2012 from <http://www.renewableenergyworld.com/rea/news/article/2008/09/wave-energy-to-power-portugal-53673>

⁹³ Europe's biggest wind farm switches on. Retrieved on 16 May 2012 from <http://www.guardian.co.uk/environment/2008/dec/02/portugal-wind-power>

⁹⁴ World's biggest solar farm at center of Portugal's ambitious energy plan. Retrieved on 16 May 2012 from <http://www.guardian.co.uk/environment/2008/jun/06/renewableenergy.alternativeenergy>

⁹⁵ Electrical cars network. Retrieved on 16 May 2012 from <http://www.carros-electricos.net/rede-para-carros-electricos-com-1-350-pontos/>

5.2. Climate Change

This chapter intends to analyze the consequences of climate change in the environment and in societies. As mentioned in chapter 4.2. climate change stresses natural resources causing an impact on human needs.

Communities that are deeply dependent on natural resources and on the ecosystems are more vulnerable when facing the damaging effects of climate change such as floods; earthquakes; storms; heat waves; forest fire; droughts and other environmental stresses. Poor communities are less prepared to prevent and overcome the damaging effects of climate change, since they do not have solid economic, political and social structures.

Climate change, according to the International Panel on Climate Change⁹⁶ (IPCC) consists of “a change in the state of the climate that can be identified (e.g. using statistical tests) by changes that persists for an extended period, usually decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity.”⁹⁷ Global efforts regarding the environment are embodied mostly in the form of agreements on climate change and environmental hazards (as for example the ASEAN Agreement on Transboundary Haze Pollution; the Convention to Combat Desertification; the United Nations Framework Convention on Climate Change; among many others).

Human activities led to the increase of concentration of greenhouse gases (GHG) in the atmosphere, principally carbon dioxide, methane and nitrous oxides, from 1970 to 2004 global emissions of GHGs increased by 70%⁹⁸. Most of the GHG emissions come from fossil fuels, the largest source 56,6%; deforestation and forest degradation, 17,3%; and land use change.⁹⁹ This increase of GHG has serious repercussions: increase in the Earth’s surface temperature; altered

⁹⁶ Established in 1988 by the World Meteorological Organization and the United Nations Environmental Programme

⁹⁷ Climate change definition by the International Panel on Climate Change (IPCC). Retrieved 8 Apr 2012, from <http://www.un.org/climatechange/pdfs/Acting%20on%20Climate%20Change.pdf> .

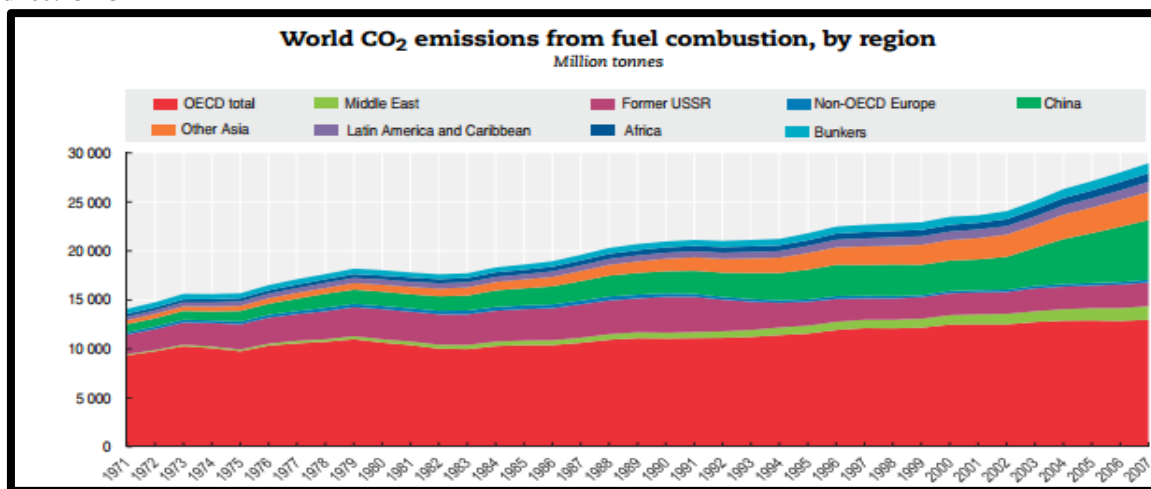
⁹⁸ Barker, T. et al. (2007). Technical summary. In: Metz, B. Davidson, R. Bosch, R. Dave, R. Meyer, A. (Eds.). Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. Cambridge.

⁹⁹ Webersik, C. (2010). Climate Change and Security, A Gathering Storm of Global Changes. PRAEGER. California. Page 4

rainfall patterns; sea level rise and increase frequency as well as severity of storms surges; floods; droughts and heat waves. These changes distress communities, for example “through agricultural-related economic losses, reduced access to clean water, loss of livelihoods and increased incidences of vector and water-borne diseases.”¹⁰⁰

Different regions contribute differently to the worlds’ CO₂ emissions derived from fuel combustion. In figure 7 it is possible to observe those differences between the year 1971 and the year 2007.

Figure 6: World CO₂ emissions from fuel combustion by region
Source: OECD



Bunkers¹⁰¹ and African countries are the biggest contributors followed by Latin America countries and Caribbean countries, as well as Asian countries, these are also the regions that have experience the higher increase in their CO₂ emissions derived from fuel combustion. OECD countries; non-OECD countries in Europe; Middle East countries and former USSR countries, have been steadily increasing their CO₂ emissions derived fuel combustion, being the ones that contribute the least in the worlds CO₂ emissions derived fuel combustion. In 2007, non-OECD European countries produced less than twice the amount of CO₂ emissions derived from fuel combustion compared with bunkers or African countries, while in the year 1971 the difference among them was not so large; it was from the beginning of the century onwards that

¹⁰⁰ McLEAn, K. (2010). *Advance Guard, Climate Chang Impacts, Adaptation, Mitigation and Indigenous Peoples*. UNU-IAS. Page 10

¹⁰¹ Fuel used in international shipping and international aviation

while the second group of countries did not have significant increases in their CO₂ emissions derived fuel combustion, the first group of countries did.

The population growth and the scarcity of resources combined are extremely hazardous. The scarcity of resources is particularly destructive in the poor countries of the South, where geographic location; fragile political settings and reliance of agriculture are higher.¹⁰² “The environmental impacts of climate change will be more severe in the low-income countries.”¹⁰³ Australia; Europe; Canada; Japan and United States together are responsible for most of the CO₂ concentrations in the atmosphere.¹⁰⁴ However Climate change effects have been experienced worldwide.

In Africa the annual rainfall is likely to decrease in the Mediterranean Africa and in the northern Sahara, conversely it is likely increase in East Africa. The United Nations University and the Institute of Advanced Studies in the analysis of a compendium of case studies concluded that the effects of climate change in Africa are entwined with human rights issues.¹⁰⁵

In Asia the rise of the sea level can affect several places such as, the low-lying areas in Bangladesh; Japan and China where fresh water supplies are at risk due to salt water intrusion. In Latin America and Caribbean, the rise of the sea level is a threat to small islands and the increase of rainfall in the winter and decrease in the summer is a threat to the all region.¹⁰⁶

In Antarctica, (an area without sovereign jurisdiction that does not belong to any State or individual, also known as global common)¹⁰⁷, especially in West Antarctica ice has been melting due to climate change, causing inland glaciers to seep up and discharge masses of ice into the sea, this happens due to two different global warming processes: the first cause of ice melting comes from below, it happens due to the warm ocean currents and the second cause comes from

¹⁰² McLEAn, K. (2010). *Advance Guard, Climate Chang Impacts, Adaptation, Mitigation and Indigenous Peoples*. UNU-IAS. Page 10

¹⁰³ Panel on Climate Change (IPCC) Fourth Assessment Report. Retrieved on 15 May 2012 from http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#T7uB_0VSTy_

¹⁰⁴ Webersik, C. (2010). *Climate Change and Security, A Gathering Storm of Global Changes*. PRAEGER. California. Page 6

¹⁰⁵ McLEAn, K. (2010). *Advance Guard, Climate Chang Impacts, Adaptation, Mitigation and Indigenous Peoples*. UNU-IAS. Page 14

¹⁰⁶ Ibid. Page 15

¹⁰⁷ Besides Antarctica, the high seas; the deep ocean floor (beyond 200 mile of the exclusive economic zone); outer space and global atmosphere are also global commons.

above, it happens due to the warm air. Moreover, the ice melting will have future impacts on the sea-level, that is expected to rise,¹⁰⁸ threatening costal urban centers.¹⁰⁹ In the Arctic, the ice is also melting and there are countries embracing this opportunity, because when the ice melts, it becomes possible to access sea routes that before were covered in ice and it also becomes possible to explore the natural resources of this region.¹¹⁰

Climate change impacts can seriously affect the lives of the populations from atoll countries.¹¹¹ Atoll countries are more vulnerable to climate change than islands, due to their small size and high population densities; isolation and water reserves restricted to subterranean freshwater lens. As a consequence, of these vulnerabilities, people might be force to migrate.¹¹²

Bernstein suggests that societies should respond to climate change by “adapting to its impacts and by reducing GHG emissions (mitigation).”¹¹³ There are several initiatives worldwide following his advice, these initiatives are implemented by governments, but also by the United Nations; regional groups, non-governmental organizations and individuals.

In Moreland, Australia the nonprofit organization (Moreland Energy Foundation Ltd – MEFL) created a program called “Zero Carbon Moreland” with the goal of reducing GHG emissions in the municipality and the inner-northern suburbs. MEFL receives founding from Moreland City Council and the Australian government. They work with schools; households; businesses; retailers; community centers and community groups, in order to, among other objectives, help people understand that the use of energy contributes to the greenhouses gas emissions that causes climate change; develop local low carbon alternatives to avoid coal based electricity generation; encourage the use energy efficient domestic, commercial and industrial appliances.¹¹⁴

¹⁰⁸ Ice-Blog – Warm ocean currents are melting the Antarctic ice. Retrieved on 19 May 2012 from <http://blogs.dw.de/ice/?cat=9>

¹⁰⁹ *Global Report on Human Settlements 2011- Cities and Climate Change* (2011). UN-HABITAT. Earthscan. London. Page

¹¹⁰ Ibid.

¹¹¹ Atolls are rings of coral reefs which enclose a lagoon.

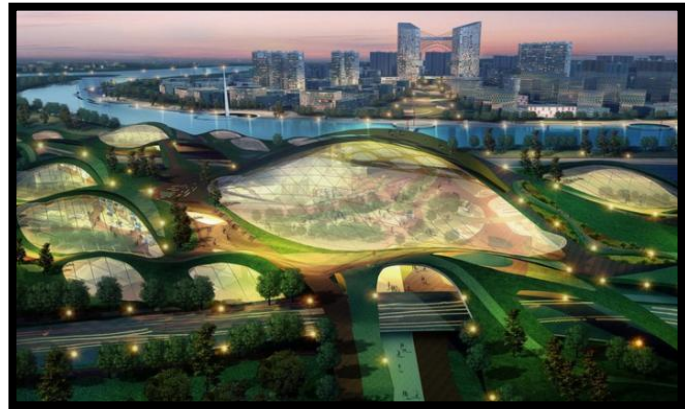
¹¹² Barnett, J. Adger, W. (2001). *Climate Dangers and Atoll Countries*. Tyndall Centre Working Paper No. 9. October. Page 1

¹¹³ Bernstein et al. (2007). *Climate Change 2007: Synthesis Report* Geneva. Intergovernmental Panel on Climate Change. Page 56

¹¹⁴ Zero Carbon Moreland. Retrieved on 23 May 2012 from <http://www.mefl.com.au/get-involved/zero-carbon-moreland.html>

The governments of China and Singapore in partnership created a project to build an eco-city in Tianjin, by 2020. The project will cost US\$ 9,7 billion. This project has a human-oriented approach, for example by 2013 there will be 12 square meters of green space per person. There will be some strict rules in the eco-city, for example, building will meet green building standards; the daily domestic waste generation cannot exceed 0,8 kg per person and by the year 2012 at least 60% of the waste will be recycled.¹¹⁵

Figure 7: Tianjin a model Eco-city
Source: Sustainablecities.dk



Curitiba, Brazil was awarded in 2010 with the Globe Award Sustainable City due to the work the city has been doing in the past years. For example the city municipal secretariat of the environment has incorporated the protection of local vegetation in their legislation, as a result it was planted 16,000 fruit trees and 260,000 flower seeds. The communities were also included in the effort to improve the city; low income families living in slums can exchange their rubbish bags for bus tickets and food.¹¹⁶ Curitiba with its 1,746,896 habitants¹¹⁷ is a real example of how the communities and the governments when working together can truly create the pathway towards a greener future.

In the past years, with the visible impacts of climate change, States and civil society have been giving more thought to the wide approach of security studies rather than the traditional one (these approaches are explained in more detail in chapter 2.) International relations actors have realized that in order to maintain their territorial integrity they need to acknowledge that there are several threats they need to be aware of and environmental security is one of them.

¹¹⁵ Tianjin: A model Eco-city in the Eastern World. Retrieved on 23 May 2012 from <http://sustainablecities.dk/en/city-projects/cases/tianjin-a-model-eco-city-in-the-eastern-world>

¹¹⁶ Curitiba: The Green Capital. Retrieved on 23 May 2012 from <http://sustainablecities.dk/en/city-projects/cases/curitiba-the-green-capital>

¹¹⁷ Brazil habitants data. Retrieved on 23 May 2012 from http://www.ibge.gov.br/censo2010/primeiros_dados_divulgados/index.php?uf=41

5.3. Insecurity and Conflicts

Contrary to the thoughts of the first and second generation of environmental and security research, that have been explained in chapter 4.2., environmental scarcity contributes to the emergence of conflicts, affecting even the most traditional security concerns - National Security. This chapter offers a detailed analysis of how environmental degradation may lead to insecurity and conflict.

Foremost it is necessary to make the distinction between conflict, conflict resources and conflict over resources. The first one, conflict is characterized “by a dispute or incompatibility caused by the actual or perceived opposition of needs, values and interests”¹¹⁸. While the second one, conflict resources “are natural resources whose systematic exploitation and trade in a context of conflict contribute to, benefit from, or result in the commission of serious violations of human rights, violations of international humanitarian law or violations amounting to crimes under international law.”¹¹⁹ Conflict over resources normally occurs over local or regional competition for scarce resources and over patterns of resource flows and use.¹²⁰ Conflict due to environmental stress is particularly damaging when is not possible to reverse the effects that were caused by the environmental stress, such as erosion or desertification.¹²¹

Natural disasters and conflicts have serious consequences in the local politics; economies; communities; but also in the environment. When conflicts and disasters occur in rural areas, there is a tendency for rural exodus towards urban areas. According to the UN – Habitat report *State of World's Cities 2006/2007* “conflicts lead to the growth and proliferation of slums as displaced people seek refuge at the margins of urban areas; buildings and roads crumble and fall in the wake of major tremors, landslides and floods.”¹²² Once in the cities, people are more vulnerable to future disasters, especially the ones living in poverty, for two main reasons: the first reason has to do with low income urban house constructions, particularly the ones situated in developing countries (slums), that are not built with the appropriate construction materials in

¹¹⁸ From Conflict to Peacebuilding. The Role of Natural Resources and the Environment. UNDP. 2009. Page 6

¹¹⁹ Ibid.

¹²⁰ Allenby, B. (2000). Environmental security: *Concept and Implementation*. International Political Science Review. Vol.21. No. 1. Page 14

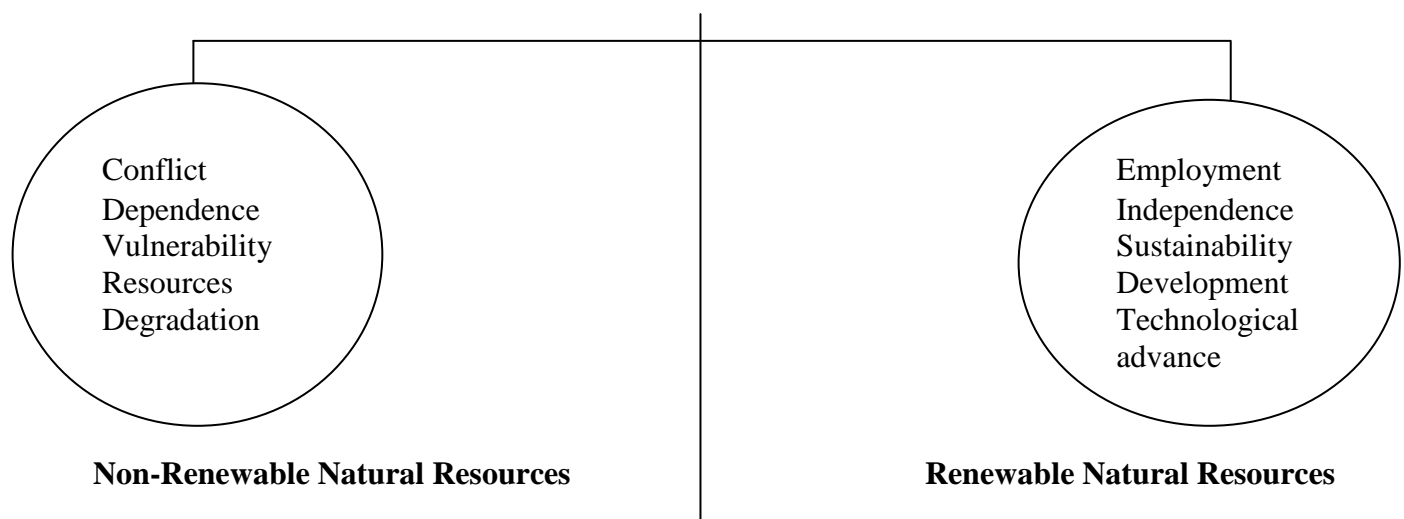
¹²¹ Report of the world commission on environment and development, 1987, 42nd session. Page 287

¹²² *State of World's Cities 2006/2007 Report*. UN-HABITAT. Earthscan. London. 2006. Page 135.

the appropriate locations – some of these houses even occupy floodplains, river banks, steep slopes; the second reason as to do with the poor responses governments in the developing countries have when facing a disaster – they have no solid political, social or economic structure to provide shelter for those in need or to provide appropriate medical care.¹²³

Governments, NGOs and civil society cannot avoid conflicts and disasters originated by natural causes, but they can create preventive measures to minimize its effects. In conflicts over natural resources it is necessary to eliminate/devalue the item that is causing many of the world's conflicts; this can be done through a global recognition of the benefits of choosing renewable natural resources and actually start using them in a large-scale. Moreover, this transition to renewable natural resources would create employment¹²⁴, which most countries with conflicts over natural resources desperately need; it would also give them more independence from international interests and from national elites. Knowing that the demand over natural resources is increasing and that the dispute over natural resources is not pacific, should we keep fighting the same battle over natural resources for another sixty years? The answer to this question is simple – investment in renewable resources.

Figure 12: Balance of Preferences



¹²³ Ibid. Page 135 - 137.

¹²⁴ Natural Resources Defense Council. Retrieved on 24 May 2012 from <http://www.nrdc.org/media/2012/120130.asp>

This choice of renewable natural resources vs. non renewable natural resources can be explained if we think of it as a balance of preferences – on the right side, the renewable natural resources side, there are elements such as employment and independence; on the left side, the non renewable resources side, there are elements such as conflict and dependence – is up to the governments that actually get affected by conflicts and disasters to chose their preference.

When environmental modifications force people to migrate, this migrations can be for a short period of time, as it happened in after the Hurricane Katrina lashed the Gulf Coast of the United States of America (August 2005) or permanently, as it has been happening in the islands and atolls of the South Pacific such as Tuvalu or Kirbati.

The definition of environmental refugees is normal associated with the work of El-Hinnawi and Norman Meyers. The first author characterizes environmental refugees as the “people who have been forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption (natural and/or triggered by people) that jeopardised their existence and/or seriously affected the quality of their life.”¹²⁵ The second author characterizes environmental refugees as “people who can no longer gain a secure livelihood in their homelands because of drought, soil erosion, desertification, deforestation and other environmental problems, together with associated problems of population pressures and profound poverty.”¹²⁶

By 1987, one million Haitians (one-sixth of the population) had to migrate and it is estimated that between 1984 and 1985 ten million African had to move from their houses (two-thirds of the world’s refugees) do to environmental degradation.¹²⁷ This number increased in 1995 when there were twenty five million environmental refugees (five million in Africa Sahel).¹²⁸ In Sub-Saharan African in the same year, there were eighty million people that had to migrate, since they had no food due of environmental factors (mainly).¹²⁹ In 2010 the number of people that had to leave their homes due to natural disasters was more than forty-two millions, not only in

¹²⁵ El-Hinnawi, E. (1985). *Environmental Refugees*. Nairobi, Kenya: United Nations Environmental Programme. Page 5

¹²⁶ Nyers, M. *Environmental Refugees: an emergent security issue*. 13th Economic Forum. Prague, 22-27 May 2005. Page 1

¹²⁷ Report of the world commission on environment and development, 1987, 42nd session. Page 286 -287

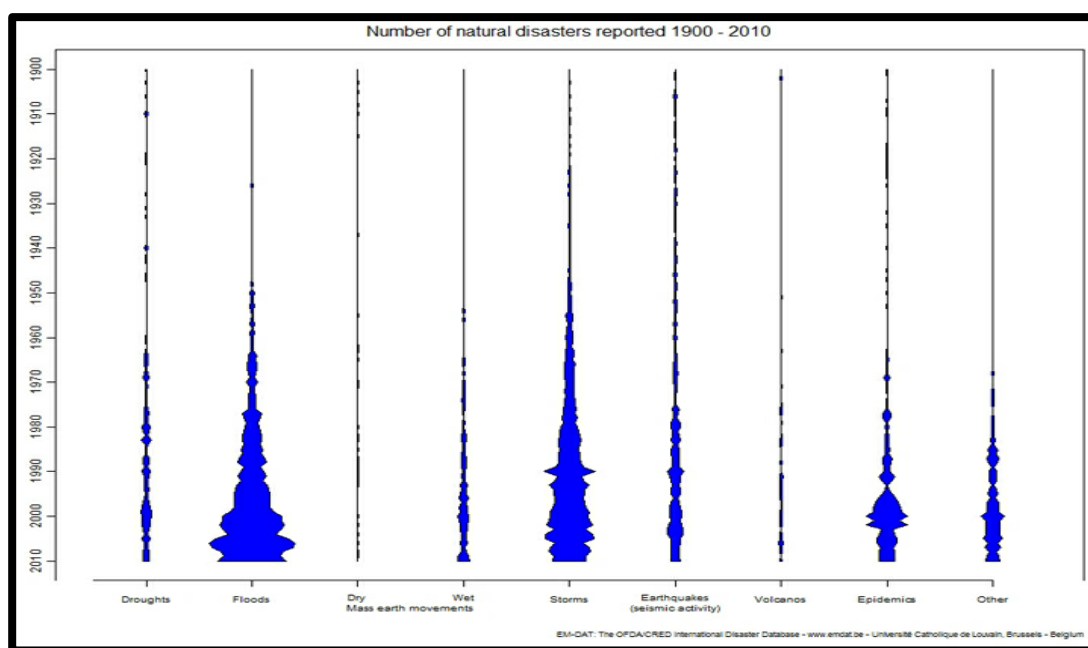
¹²⁸ Nyers, M. *Environmental Refugees: an emergent security issue*. 13th Economic Forum. Prague, 22-27 May 2005. Page 1

¹²⁹ Ibid.

African countries, but also in China, Mexico, among other countries. It is expected that by 2050 there will be two hundred million environmental refugees,¹³⁰ representing an increase of more than 300%. Although, it is necessary to have in consideration that the population is also increasing, it is expected that between 2010 and 2050 the population will increase 29%.¹³¹

Figure 14: Number of natural disasters report 1990 – 2010

Source: EM-DAT.– CRED



According to the figure 14, the number of natural disasters reported between 1900 and 2010 increased drastically from the mid 1900's onwards. This increase was particularly visible in natural disasters caused by floods, storms and epidemics; nonetheless it was also visible in natural disasters caused by droughts and earthquakes; the natural disasters that increase the least over the years were dry mass earth movements and volcanoes.

In 1987, the Report on the 42nd session of the World Commission on Environment and Development warned governments that they were not equipped to deal with the consequences that environmental stress has on international conflicts and on national interests.¹³² Moreover, twenty years later and judging by the increase of conflicts as well as migrations due to natural

¹³⁰ *Migration and Climate Change*. (2008). IOM Migration research series. N. 21. Page 11

¹³¹ Ibid.

¹³² Report of the world commission on environment and development, 1987, 42nd session. Page 297

disasters and environmental insecurity governments are still not prepared to deal with the consequences environmental stress may have on their territories.

In chapter 2.2, it was already established that climate change may cause insecurities that sometimes result in conflict, this can happen for example due to political economic changes in energy sources or due to social vulnerabilities caused by climate change impacts. Darfur is an example of environmental degradation as a cause of conflict and how social changes caused by climate change impacts can result in conflict. Darfur was in state of humanitarian emergency between 2003 and 2010 due to a civil war between the government of Sudan and two rebel movements that erupted. Although the conflict escalated to an ethnically oriented civil war, the initial cause of the conflicts was the “competition over dwindling natural resources.”¹³³ Long periods of drought have been recurrent in the Darfur region for the past five decades; as a consequence Darfur is a very poor region. The droughts were particularly severe in the northern region of Darfur leading to migrations of the nomads of the north to the southern regions resulting in conflict between the nomads and the sedentary tribes like Fur and Masalit.¹³⁴ It is possible to conclude that the Darfur conflict had in its origins from an “ecological imbalance, scarcity of water, deforestation, mismanagement of natural resources, claimed inequality in the distribution of available resources and national projects.”¹³⁵

After the Cold War conflict has increased. Non-states entities, such as terrorism; organized crime; drug traffickers; refugees among other entities became potential factor actors of conflict. Also, “while political and military issues remain critical, conceptions of conflict and security have broadened: economic and social threats including poverty, infectious diseases and environmental degradation are now also seen as significant contributing factors.”¹³⁶

Environmental cooperation is used as a strategy in environmental peacemaking in order to reduce the tensions between the parties in conflict. Environmental cooperation has several benefits, such as the promotion of dialogue between parties during times of conflict¹³⁷; the

¹³³ *Environmental Degradation as cause of conflict*. Conference proceedings. University of Peace. December 2004. Page 7.

¹³⁴ Ibid.

¹³⁵ Ibid. Page 12.

¹³⁶ *From Conflict to Peacebuilding, The Role of Natural Resources and the Environment*. United Nations Environmental Programme. Kenya. 2009. Page 6

¹³⁷ Ibid.

promotion of post-conflict collaboration in vital areas (economy; agriculture; health; etc)¹³⁸; the creation of policies in order to avoid future conflicts. Once again, the creation of a global environmental network proves to be necessary in order to assure environmental security.

¹³⁸ *From Conflict to Peacebuilding, The Role of Natural Resources and the Environment*. United Nations Environmental Programme. Kenya. 2009. Page 6

5.1. Institutionalization of the Environment

International debates concerning the environment began in the 60's and 70's with the Stockholm Conference¹³⁹ and the United Nations Conference on Environment and Development (UNCED)¹⁴⁰. However, the globalization of the debates started in the 90's due to the changes in the international system (end of Cold War, globalization of communications and transports) and the scientific advance.¹⁴¹

By the end of the 1980's, two great threats were facing humankind: nuclear power and environmental devastation. In 1987, it was released the Brundtland Report¹⁴², environmental issues were becoming a relevant topic in world politics, especially in the developed countries. However newly industrialized countries¹⁴³ were still using industrial processes with a malign impact to the environment in order to obtain higher profits. The Brundthland Report has a full chapter dedicated to the Sustainable Development Concept – it declares that the major objectives of development are to satisfy human needs and aspirations; nonetheless many people “live beyond the world's ecological means”¹⁴⁴ and therefore, they should be encourage to change their consumption standards from abusive to ecologically acceptable. There are some principles and practices that can be associated with the Sustainable development, such as: substantives principles – policy integration; eco-efficiency and equity; procedural principles – precaution; broad participation and transparency; mechanisms – new policy instruments; policy learning and multi-level coordination.¹⁴⁵

Global warming threat has increased in the past decades, as a result of the increasing release of greenhouse gases such as methane and carbon dioxide into the atmosphere. In Rio '92 on the

¹³⁹ Report of the United Nations conference on the human environment. Stockholm 1972. Retrieved on 10 Apr 2012 from <http://www.unep.org/Documents/Multilingual/Default.asp?DocumentID=97>>

¹⁴⁰ United Nations conference on Environment and Development. Rio de Janeiro 1992. Retrieved on 11 Apr 2012 from <http://www.un.org/geninfo/bp/enviro.html>>; 06 January 2012

¹⁴¹ *Meio Ambiente*; Puc-Rio; Setembro 2007; Rio de Janeiro; Page 86

¹⁴² Also known as: *Our Common Future*.

¹⁴³ Brazil; China; India; Malaysia; Mexico; Philippines; South Africa; Thailand and Turkey.

¹⁴⁴ *Our Common Future*, Chapter 2: Towards Sustainable Development. Retrieved on 07 May 2012 from <http://www.un-documents.net/ocf-02.htm#I>

¹⁴⁵ Schreurs, m. Selin, H. VanDeveer, S. (eds.). *Transatlantic Environmental and Energy Politics – Comparative and International Politics*. ASHGATE. Great Britain. Page 24

United Nations Conference on Environmental and Development (UNCED)¹⁴⁶ new principles regarding the relationship between human beings and the environment were introduced: “Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature”¹⁴⁷ and also that “States have a sovereign right to exploit their own resources but not to cause damage to the environment of other States.”¹⁴⁸ The precautionary Principle¹⁴⁹, declares that states “where there are threats of serious or irreversible damage, a lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”¹⁵⁰ This was a ground-breaking conference on behalf of the environmental – it took power from the States and gave it to individuals – it promoted international cooperation and created measures to combat global environmental issues; 180 governments adopted three key international agreements: Rio +20 Declaration on Environment and Development; Agenda 21 and the Statement of Forest Principles. Other agreements were signed, such as the Convention on Biological Diversity and the UN Framework on Climate Change. Ten years later the Rio+20 Conference on Sustainable Environment, will take place once again in Rio de Janeiro in June 2012.

In 1997 it was adopted in Kyoto the Kyoto Protocol, that entered into force only in 2005. In 2011 there were 191 States that adopted the protocol and 1 regional economic integration organization, the European Union. However, in 2011 the government of Canada has decided to withdraw from the Kyoto Protocol, which will have effect in December 2012.¹⁵¹ According to the Canadian minister of the environment Peter Kent, Canada pulled out because “the Kyoto Protocol does not cover the world's largest two emitters, United States and China, and therefore cannot work.”¹⁵² The goals of the Kyoto protocol are to reduce GHG; hydrofluorocarbons and

¹⁴⁶ With representatives from 172 countries and 2400 NGOs.

¹⁴⁷ United Nations Conference on Environment and Development (1992). Retrieved on 17 Apr 2012 from <http://www.un.org/geninfo/bp/envirp2.html>.

¹⁴⁸ Ibid.

¹⁴⁹ Principle 15.

¹⁵⁰ Morel, B. Linkov, I. (2006). *Environmental security and Environmental Management: The Role of Risk Assessment*. NATO Security through Science Series. Page 11.

¹⁵¹ Ibid.

¹⁵² Canada formally pulls out of the Kyoto Protocol on climate change. Retrieved on 27 May 2012 from <http://www.startribune.com/world/135469408.html>

perfluorocarbons by 4,2% between 2008 and 2012.¹⁵³ In order to achieve these goals, mechanisms were created: emissions trading; Joint implementation and clean development mechanisms.

Emissions trading consist of “financing bodies and mechanisms that can exchange the carbon credits. This could take the form of ‘voluntary markets’ (that are formed under agreed bilateral mechanisms between the trading parties) or ‘compliance market’ (that are legally regulated to meet emission reduction target under multilateral agreements).”¹⁵⁴ A carbon credit is equivalent to one tone of CO₂eq.¹⁵⁵ The carbon market can be very helpful for the environment, but also for the economy, in 2009 it reached US\$136 billion compared with the US\$58 billion in 2007¹⁵⁶. By buying carbon credits, companies or countries that exceed their GHG emissions quota do not have to pay a fine. “Emissions trading, (...), allows countries that have emission units to spare - emissions permitted them but not "used" - to sell this excess capacity to countries that are over their targets.”¹⁵⁷

Joint implementation (JI) “allows a country with an emission reduction or limitation commitment under the Kyoto Protocol to earn emission reduction units from an emission-reduction or emission removal project.”¹⁵⁸ This mechanism is particularly interesting for countries with efficient power plants.¹⁵⁹ Clean Development Mechanism (CDM), has the same principle than JI, however while in joint implementation the trade can only be made between developed countries, in the CDM the trade is made between developed and developing countries.¹⁶⁰

¹⁵³ Long-term trend in global CO₂ emissions. 2011 report. Retrieved on 27 May 2012 from http://www.pbl.nl/sites/default/files/cms/publicaties/CO2%20Mondiaal_%20webdef_19sept.pdf

¹⁵⁴ *Simply REDD- guide to florets, climate change and REED*. CIFOR. Page 15

¹⁵⁵ Climate change glossary of key terms. Retrieved on 27 May 2012 from <http://www.epa.vic.gov.au/climate-change/glossary.asp#CAM>

¹⁵⁶ Carbon Market Grew as Prices Fell in 2009. Retrieved on 27 May 2012 from <http://green.blogs.nytimes.com/2010/01/07/carbon-market-grew-as-prices-fell-in-2009/>

¹⁵⁷ Kyoto Protocol mechanisms. Retrieved on 27 My 2012 from http://unfccc.int/kyoto_protocol/mechanisms/emissions_trading/items/2731.php

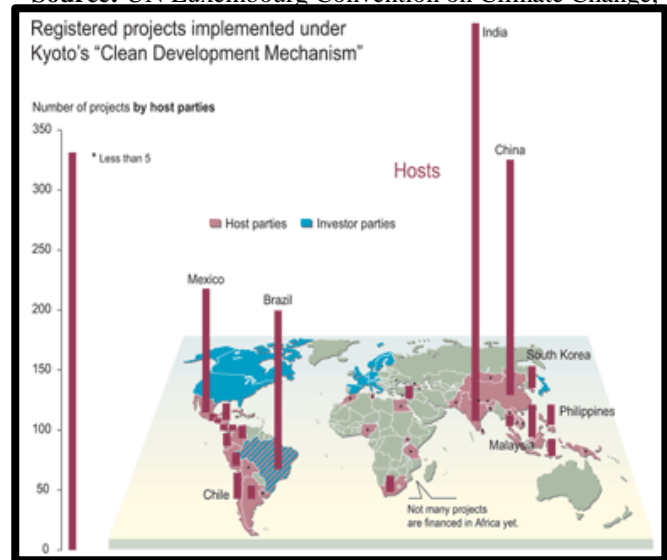
¹⁵⁸ Joint implementation. Retrieved on 27 May 2012 from http://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php

¹⁵⁹ Baylis J. Smith S. Owens P. (eds). *The Globalization of World politics: An Introduction to International Relations*. Oxford University Press. Oxford. Page 363

¹⁶⁰ Ibid.

As it is possible to observe in figure 8, India; China; Mexico; Brazil; Chile; South Korea and Philippines are among the host countries with more projects, while Canada, USA; Portugal, United Kingdom; Norway; Finland; Italy; Switzerland; The Netherlands; Japan; Germany; Spain; Italy; Austria; Denmark; Belgium; Brazil and Luxemburg are the Investor parties. Most of the projects are energy related (renewable and non-renewable).¹⁶¹ Brazil, the only host and investor country, promoted in 2007 an auction to sell carbon credits from the Bandeirantes landfills in São Paulo.¹⁶²

Figure 8: Projects implemented by CDM
Source: UN Luxembourg Convention on Climate Change.



In July 2000 the United Nations created an initiative called the United Nations Global Compact (UNGS), the goal of this initiative is to encourage businesses to adopt sustainable and socially responsible policies in diverse areas such as human rights; labor; anti-corruption. UNGS has 10 principles, but only principle 7, 8 and 9 relate with this thesis, since they focus on to the environment. Principle 7 affirms that “businesses should support a precautionary approach to environmental challenges”¹⁶³ this idea of a precautionary approach¹⁶⁴ is applied to business and to the idea that preventive measures regarding the environment will, in the long run be more cost-effective than taking action after the damage as occurred. Principle 8 incentives business to “undertake initiatives to promote greater environmental responsibility”¹⁶⁵ some of the proposed initiatives consist in re-defining company visions, policies and strategies regarding sustainable development. Principle 9 affirms that business should “encourage the development and diffusion of environmentally friendly technologies”¹⁶⁶ by, for example reducing the use of raw materials

¹⁶¹ UN guide to climate neutrality. Retrieved on 27 May 2012 from <http://www.unep.org/publications/ebooks/kick-the-habit/ShowPicture.aspx?imgID=ID0EBFAI>

¹⁶² Economy, Bandeirantes landfills. Retrieved on 27 May 2012 from <http://noticias.uol.com.br/ultnot/economia/2006/04/06/ult29u47126.jhtm>

¹⁶³ UNGS ten principles. Retrieved on 23 May 2012 from <http://www.unglobalcompact.org/AboutTheGC/TheTenPrinciples/index.html>.

¹⁶⁴ Idea inspired on Principle 15 of the 1992 Rio Declaration (that is explained in chapter I of this thesis).

¹⁶⁵ Ibid.

¹⁶⁶ Ibid.

or investing in new research techniques. All in all UNGS supports and institutionalizes the idea of companies to stop business as usual with the goal of creating a pathway for a greener future. However, UNGS does not regulate states or companies; it is a forum for discussion that includes governments; companies and labor organizations.

Figure 9 shows that the number of bilateral environmental agreements was higher in the 1970's and the 1990's and lower in the 2000's having tripled when compared with the previous decades and almost quadruplicate when compared with the 2000's. Figure 10 shows that multilateral environmental agreements, as well as the amendments to those agreements, had a steady increase between 1950 and 1989 and the number of protocols almost doubled in the 1980's, when compared with the previous years. In the 1990's the number of agreements and amendments doubled when compared with the previous decade and the number of protocols had a steady increase. In the 2000's, the number of agreements decreased to almost half; the number of protocols decreased to less than half and the number of amendments had a slight decrease. When compared, the graphs show that every decade between the 1950s' and 2009, the number of bilateral environmental agreements was higher that the number of multilateral environmental agreements.

Figure 9: Bilateral environmental agreements
Source: International environmental agreement database

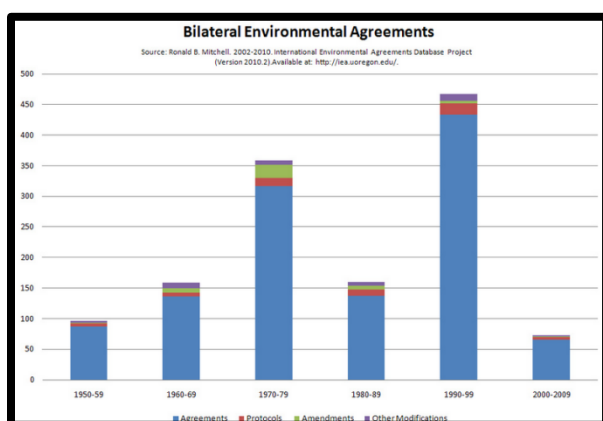
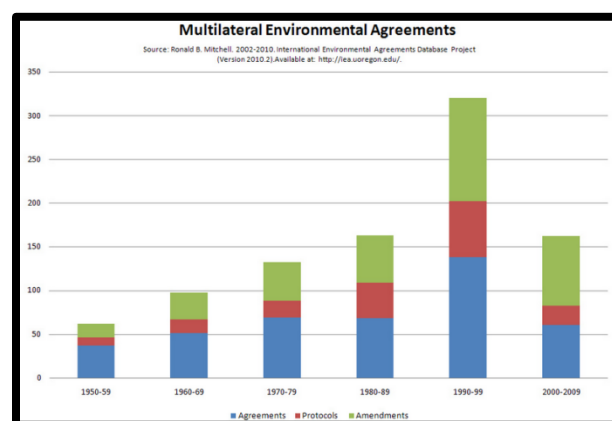


Figure 10: Multilateral environmental agreements
Source: International environmental agreement database



In an increasingly globalized and interdependent world, civil society has been active in their efforts to change the decision making-processes in global and local interventions in several areas, being global warning one of them. Civil society has an important role assisting States and communities to mitigate the effects of climate change. However, some authors argue that civil

society should play a bigger role in global environmental governance in areas as: the information collection and dissemination; policy development consultation; policy implementation; assessment and monitoring; and advocacy for environmental justice.¹⁶⁷

It is necessary to continue investing in a global environmental network that helps governments and civil society to work together towards a greener future. It is necessary to keep creating global initiatives like the Kyoto Protocol, however this initiatives need to be adopted not only by States that already have an environmental conscience, but also by States that pollute the most, such as China and the US with 6,018 and 5,903 million tons of GHG emissions each year, respectively.¹⁶⁸ It is necessary for the countries that pollute the most to compromise, regarding the mitigation of climate change effects, otherwise they will discourage other countries to compromise, like it happen when Canada pull out of the Kyoto Protocol.

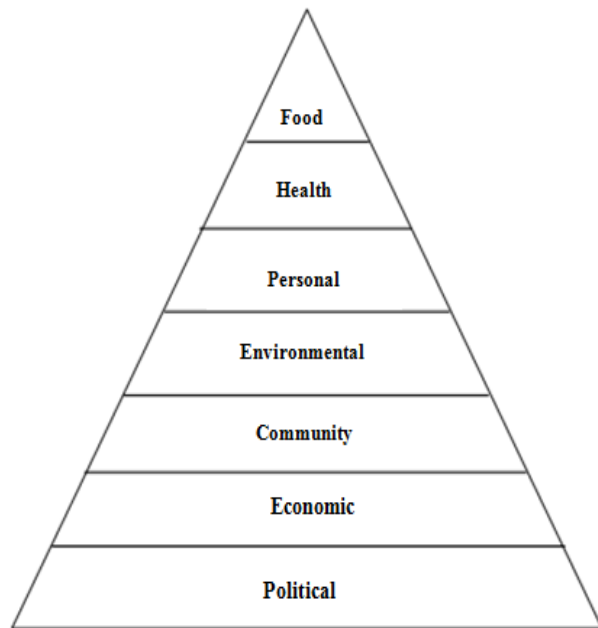
¹⁶⁷ Bamidele-Izu,, G. A. *The Role of NGOs and Civil Society in Global Environmental Governance*. Retrieved on 29 May 2012 from <http://environment.research.yale.edu/documents/downloads/a-g/gemmill.pdf>

¹⁶⁸ World biggest GHG emission producers. Retrieved on 30 May 2012 from <http://www.reuters.com/news/pictures/slideshow?articleId=USRTXRKSI#a=1>

5.2. Perception on Environmental Security

In order to understand the perception people have regarding environmental security, an on-line survey composed by seven close questions and open questions was made with a total of 216 respondents.¹⁶⁹ The simple random sample of this survey, represents mainly the perception of people from developed countries, since there were not many answers from people living in developing countries. In total, this survey has representatives of 39 different nationalities.¹⁷⁰ Regarding the education, most of the sample, 52% has a bachelor degree; 22% has a Master degree; 19% has High School Diploma and 7% has a PhD¹⁷¹. Most of the sample are females with ages between 19 and 27 years old, however, there are representatives from both sexes between the ages of 16 and 71 or older¹⁷².

Figure 15: Pyramid of Perception



This pyramid represents the perception people have on security and the influence of security in their lives.

Political security, which consists in the “organizational stability of states, systems of government and the ideologies that give that legitimacy”¹⁷³, was considered the most important dimension of security, therefore is placed in the lowest level. Economic security, which consists in the “access to the resources, finance and markets necessary to sustain acceptable levels of welfare,”¹⁷⁴ was considered

¹⁶⁹ Survey layout and responses available in Appendix

¹⁷⁰ Figure 7 in Appendix II

¹⁷¹ Figure 1 in Appendix II

¹⁷² Figure 5 in Appendix II

¹⁷³ Notions of Security, shifting Concepts and Perspectives. Retrieved on 24 May 2012 from http://www.iriapaz.org/list_vert/08/Notions%20Security%20Transnational%20Terrorism.pdf

¹⁷⁴ Ibid.

to be the second most important. Community security, which consists of freedom from fear at the community level to both groups and individuals,¹⁷⁵ was considered the third most important. Environmental security, was considered the fourth most important, dividing the three most important and the three less important security dimensions according to the respondents' perceptions on security. Personal security, which consists of a living environment without physical violence, crime, terrorism, domestic violence, child abuse¹⁷⁶ among other threats to a person well-being, was considered the fifth most important. Health security, which consists of living free from deadly infectious diseases, unsafe food, malnutrition, lack of access to basic health care¹⁷⁷ and all the threats that put a human life at risk, was considered the sixth most important. Food security, which consists of freedom from hunger¹⁷⁸, was considered the least important of the UNDP dimensions of security.

Environmental security, which is in the middle of the pyramid, was considered to be more relevant than basic needs, such as food security. From that it is possible to infer that people are aware of the scarcity of resources, climate change, etc, and that they are concerned about the security of the environment. It is possible to interpret in two different ways the choice of environmental security over food security, the first one being that people realize that agriculture is deeply dependent on the environment and therefore a impaired environment results in food insecurity; the second one has to do with the fact that most of the respondents come from countries where food security is not a reason of tension and for that reason they did not prioritize food security over environmental security.¹⁷⁹

As mentioned before, the world has changed a lot in the past decades, especially due to the II World War, the Cold War and the globalization process. In 1943, Abraham Maslow on his paper *A Theory of Human Motivation*, created the "hierarchy of needs" that is also represented by a pyramid. In Maslow's pyramid, physiological needs (such as food) were considered the most important, because they are a requirement for human survival. Security needs (such as personal;

¹⁷⁵ Community Security and arms control in Southern Sudan. Retrieved on 26 May 2012 from http://www.sd.undp.org/projects/s_cp2.htm

¹⁷⁶ *Human Security In Theory and Practice. Applications of the Human Security Concept and the United Nations Trust Fund for Human Security*. Human Security Unit. OCHA. United Nations. Page 7

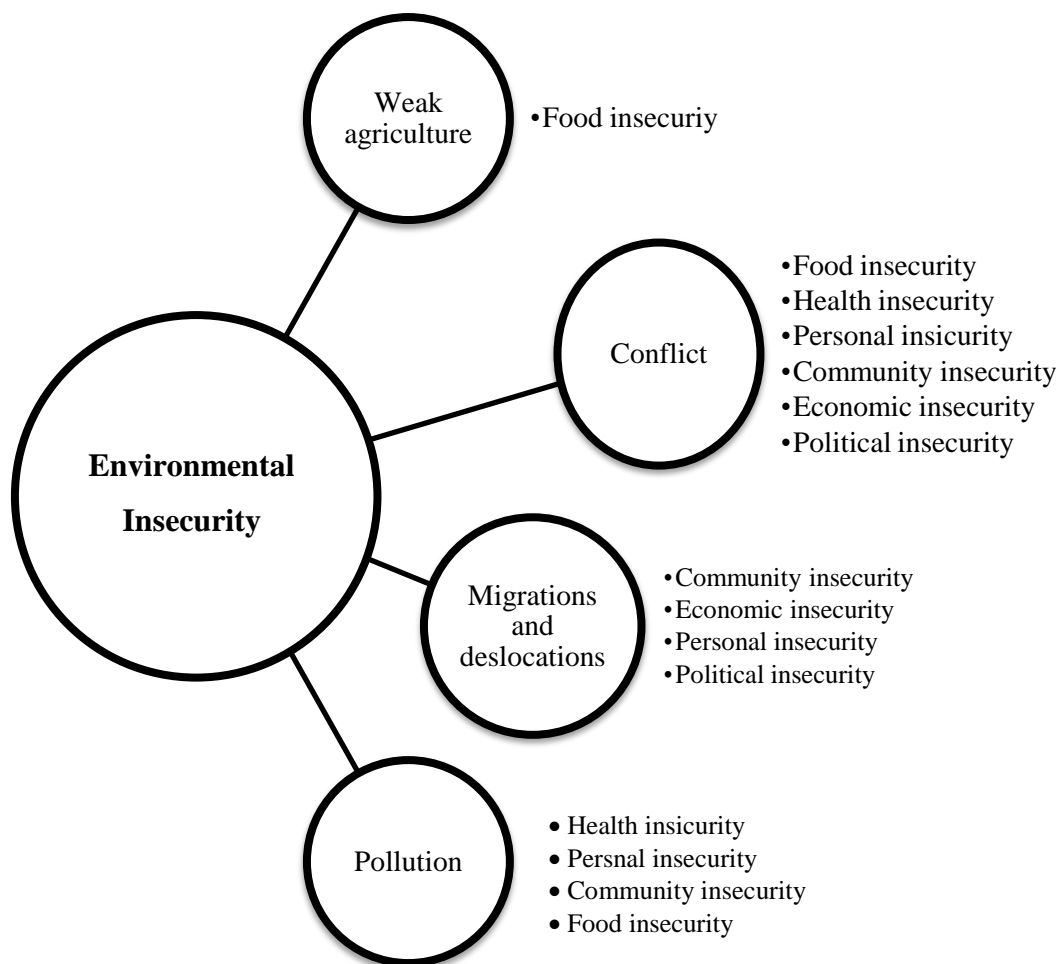
¹⁷⁷ Ibid.

¹⁷⁸ Ibid.

¹⁷⁹ These are only speculations, a new survey would have to be made asking with the respondent to prioritize the 7 dimensions of security the way they did.

economy and health) or the feeling of belonging to a community were considered less important. It is possible to say that priorities have changed since the last century. Moreover, it is possible to observe that if before environmental security was not contemplated as a basic need of human being lives, nowadays it is not only contemplated, but also considered one of the most important securities the human being can aspire for. This might have to do with the fact that when environmental security is not assured, other dimensions of human security cannot be assured either.

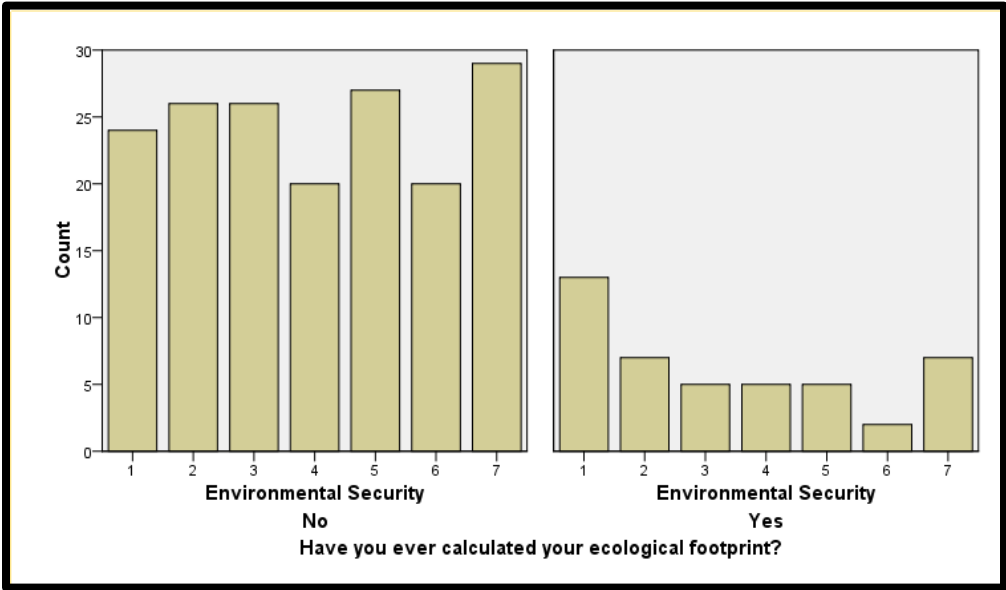
Figure 16: Consequences of Environmental Insecurity



The respondents that have calculated their ecological footprint consider environmental security to be the most crucial area of security, while the ones that have not calculated it, consider

environmental security to be the least crucial area of security. However, most of the respondents have not ever calculated their ecological footprint.

Figure 17: Have you ever calculated your ecological footprint?



Almost all the respondents are taking action in their own hands in order to reduce their ecological footprint. The most popular actions consist of grocery shopping in local supermarkets and organic food; either use the bicycle or public transportation as a transportation option and recycle.

Governments; United Nations; European Union; Civil society, they all have an important role ensuring a greener future. However when asked which of these actors people trusted the most 38% choose NGO’s; 28% Civil Society; 11% United Nations; 9% answer that they did not trust either; 7% choose the European Union¹⁸⁰ (all of them European, except one Brazilian that lives in Europe for twelve years already and an American) and the same number of people choose their government. When asked how well they thought governments ensure the pathway for a greener future, 59% answered not well, 28% terrible; 12% well and 1% very well.

There were some interesting suggestions regarding actions to mitigate climate change effects, such as the implementation of a transportation network environmental friendly; a legally binding

¹⁸⁰ Figure 4 in Appendix II.

treaty for all nations, with emissions reduction targets to succeed the Kyoto Protocol; start a worldwide campaign showing the consequences of climate change effects. Most people consider two actions to be the most important in order to mitigate the effects of climate change: the transition to greener energies and a change in the transportation systems. Moreover, people were consciously of the effects of climate change and many of them consider they could do more in their daily lives.

Public opinion concerning environmental factors has been changing in the past years. In 2006 the MIT made a survey to find out the public opinion (in the USA) about the need for action to address global warming. This survey was compared to one made in 2003 and the conclusions that were draw form it, were that while in 2003 only 17% of the respondents considered global warming a serious problem and that immediate action was necessary, that number increased to 28% in a three years time frame.¹⁸¹

The Public Policy Institute of California made a survey in 2011 regarding the environment. In this survey, 75% of the respondents considered that it was necessary to take steps to counter the effects of global warming right away, while two years before in 2009 that percentage decreases 10%. When asked if the government should regulate the release of greenhouse gases from sources like power plants, cars and factories in order to reduce global warming 79% was in favor. The majority of the respondents agree that the governments (either federal, local or state) do not do enough to address global warming.¹⁸²

In a survey made to European citizens by the European Commission in 2004 about the attitudes of European citizens towards environment, as it happened in the survey made for this thesis, NGOs are who people trust the most when it comes to environmental issues. 72% of the respondents, considered environmental policies to be important in the quality of life.¹⁸³

In a survey made in 51 countries in 2011 by Nielsen about the sustainable efforts and environmental concerns around the world, 22% of the respondents are willing to pay more for

¹⁸¹ MIT survey: Climate change tops American's environmental concerns. Retrieved on 26 May 2012 from <http://web.mit.edu/newsoffice/2006/survey.html>

¹⁸² PPIC Statewide Survey: Californians & the Environment. Retrieved on 26 May 2012 from http://www.ppic.org/content/pubs/survey/s_711mbs.pdf

¹⁸³ The attitudes of European citizens towards environment. Eurobarometer. Retrieved on 26 May 2012 from http://ec.europa.eu/environment/archives/barometer/pdf/summary_ebenv_2005_04_22_en.pdf

eco-friendly products; 76 % of the respondents say raw material influence their decisions on where to shop and what to buy and 83% of the respondents say it is important for companies to have environmental programs.¹⁸⁴

Civil society has become more aware of environmental scarcity and is willing to make efforts in order to improve their relationship with the environment, the higher the perception of environmental issues people have, the higher efforts they will make in order to protect the environment. A civil society global environmental network can be very useful to cope with the effects of climate change in several aspects, for example by improving peoples' perception regarding the environment or by working at a local level instead of a national or regional one. There are already several NGOs concerned with environmental issues with projects all over the world, such as Friend of the Earth or Greenpeace; there are also several pressure groups concerning environmental security, for example the British Royal Society or the US Sierra Club.

¹⁸⁴ Sustainable efforts & Environmental concerns around the world. Retrieved on 26 May 2012 from <http://www.nielsen.com/content/dam/corporate/us/en/reports-downloads/2011-Reports/nielsen-sustainability-report.pdf>

6. Conclusion

The harmful influence of human impact accelerates the climate change process, leading to severe environmental effects. Climate change is a global phenomenon, with consequences that impact all countries, directly or indirectly. Thus, the solution for this phenomenon should be global.

International cooperation seems to be the key to ensure the security of the environment. In order to mitigate the effects of climate change it is necessary to create a global environmental network that relies on the cooperation of both national and international relations actors. For this global environmental network to succeed, the cooperation between States and between States and civil society is essential. States have the power to implement environmental policies, but if civil society is not willing to accept those policies, they will not be so efficient as if the civil society was willing to accept them. Civil society has an important role in pressuring States to adopt more efficient environmental policies. The creation of preventive mechanisms is crucial in order to avoid the escalation of vulnerabilities in the future. The longer we wait to invest in environmental security, the worse and more expensive the problem will get.

Transition processes from non-renewable natural resources to renewable natural resources are expensive and not necessarily a seamless process, therefore not all governments are willing to invest in this transition. However, in the long-term, this transition will avoid States' to be vulnerable and it will also bring them benefits as explained through the creation of a balance of preferences (i.e. employment; independence; sustainability; development; technological advance). The transition to renewable sources of energy in the South should be made with the help of developed countries, this help should be based on cooperation and expertise transfer, it should not be done exclusively through loans or through massive punctual entrance of companies from developed countries.

My conclusion is not that we should all ride our bicycles to work, or school (not all of us live in flat countries like Denmark or Holland), but we all should adapt our day-to-day habits into a greener lifestyle. Governments; NGO's; United Nations they are all important in battle to assure environmental security, but the individuals have to be a part of that battle as well.

I would like to finish this thesis by pointing out that although I make several references to the term environmental refugee, particularly in section 5.5.; according to international law, the status of refugee cannot be given to a person that has fled the country due to environmental stress. According to international law, “a refugee is a person who owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion, is outside the country of his nationality, and is unable to or, owing to such fear, is unwilling to avail himself of the protection of that country”¹⁸⁵. An increasing number of people are being forced to move from their homes due to environmental issues. Hence, the concept of refugee should be expanded, in order to also include people that fled from their countries due to environmental stress. This could be a good theme for debate in a global environmental network.

¹⁸⁵ *Migration and Climate Change*. (2008). IOM Migration research series. N. 21. Page 11

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