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Reconceptualizing Security:
Global Environmental and Climate Change
as new Security Dangers and Concerns[1]

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1. Introduction: Reconceptualizing Security: Conceptual Results Four Years after Montreal

As a result of the end of the Cold War a global reconceptualization of security has emerged, that geographically widened due to globalization. With the approaching shift in earth history from the 'Holocene' to the 'Anthropocene' new objective security dangers have been socially constructed since the 1980's. New global problems pose fundamental threats, challenges, vulnerabilities and risks for individual human beings and humankind (Brauch 2005, 2005a).

It was the Reagan Administration that put climate change on the agenda of a G-7 meeting in Canada in fall of 1988 (Brauch 1996). From 1996-1999, The U.S. Defense Department and the German Environment Ministry jointly launched a project on environmental security within NATO (NATO 1999; Carius/Lietzmann 1999). Since 2003, OSCE, UNDP and UNEP, with NATO as an observer, have launched the *Environmental Security Initiative* (ENVSEC) that focuses on South-Eastern Europe, the Caucasus and Central Asia. Since 2001, the European Union and two European G-8 countries, the UK and Germany, have put climate change on the top of their G-8 policy agendas and in April 2007, the British Foreign Office put it for the first time on the United Nations Security Council agenda (Brauch 2003, 2008x).

These policy changes have resulted in a security discourse that has addressed the *widening* (from the narrow military to political, economic, societal and environmental dimensions), *deepening* (from national to human and gender security) and *sectorialization* (energy, water, desertification, food, health, livelihood) of security issues.

At the 45th Annual ISA Convention in Montreal, Canada in March 2004, Peace Research and European Security Studies (AFES-PRESS) launched a global scientific dialogue project on

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[1] This paper relies on the author's introduction to: Brauch/Oswald Spring/Mesjasz/Grin/Dunay/Behera/Chourou /Kameri-Mbote/Liotta (2008); and first draft introduction to: Brauch/Oswald Spring/Grin/Mesjasz/Kameri-Mbote/Behera/Chourou/Krummenacher (2008) and on the co-authored chapter by Oswald Spring/Brauch/ Dalby (2008).

'Reconceptualizing of Security' that has involved about 300 scholars from many disciplines in the social and natural sciences from all parts of the world. As a result of several workshops (Montreal 2004, Sopron 2004; The Hague 2004; Istanbul 2005, Bonn 2005) three major reference books have emerged (with 175 book chapters in the first two volumes) that are being published in 2008 and an approximately 100 chap. in vol. III that will follow in 2009 on linkages of security concepts with globalization, global environmental change and disasters.

References to this global project:

ISA, Montreal, 2004: http://www.afes-press.de/html/download_isa.html
IPRA, 2004: http://www.afes-press.de/html/download_sopron.html)
Pan European Conference, 2004: http://www.afes-press.de/html/the_hague_programme.html
First World Conference, 2005 http://afes-press-books.de/html/workshop_istanbul.htm
IHDP, 2005: http://afes-press-books.de/html/workshop_bonn.htm
HEXAGON-Book Series: (http://afes-press-books.de/html/hexagon.htm.

o   Hans Günter Brauch, Úrsula Oswald Spring, Czeslaw Mesjasz, John Grin, Pal Dunay, Navnita Chadha Behera, Béchir Chourou, Patricia Kameri-Mbote, P.H. Liotta (Eds.): *Globalization and Environmental Challenges: Reconceptualizing Security in the 21 st Century*. Hexagon Series on Human and Environmental Security and Peace, vol. 3 (Berlin – Heidelberg – New York: Springer-Verlag, 2008); see at: <http://www.afes-press-books.de/html/hexagon_03.htm>.
o   Hans Günter Brauch, Úrsula Oswald Spring, John Grin, Czeslaw Mesjasz, Patricia Kameri-Mbote, Navnita Chadha Behera, Béchir Chourou, Heinz Krummenacher (Eds.): *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts*. Hexagon Series on Human and Environmental Security and Peace, vol. 4 (Berlin – Heidelberg – New York: Springer-Verlag, 2008), i.p .
o   Hans Günter Brauch, Úrsula Oswald Spring, Czeslaw Mesjasz, John Grin, Patricia Kameri-Mbote, Béchir Chourou, Pal Dunay, Jörn Birkmann, (Eds.): *Coping with Global Environmental Change, Disasters and Security – Threats, Challenges, Vulnerabilities and Risks* . Hexagon Series on Human and Environmental Security and Peace, vol. 5 (Berlin – Heidelberg – New York: Springer-Verlag, 2009).

In the *first volume* on *Globalization and Environmental Challenges* new security dangers and concerns are discussed. In this reference book on global security thinking, 92 authors from five continents and many disciplines, from science and practice, assess the global reconceptualization of security triggered by the end of the Cold War, globalization and manifold impacts of global environmental change in the early 21st century. In 10 parts, 75 chapters address the theoretical, philosophical, ethical and religious and spatial context of security; discuss the relationship between security, peace, development and environment; review the reconceptualization of security in philosophy, international law, economics and political science and for the political, military, economic, social and environmental security dimension and the adaptation of the institutional security concepts of the UN, EU and NATO; analyze the reconceptualization of regional security and alternative security futures and draw conclusions for future research and action.

In the second volume of this policy-focused, global and multidisciplinary security handbook on *Facing Global Environmental Change* addresses new security threats of the 21st century posed by climate change, desertification, water stress, population growth and urbanization. These security dangers and concerns lead to migration, crises and conflicts. They are on the agenda of the UN, OECD, OSCE, NATO and EU. In 100 chapters, 132 authors from 49 countries analyze the global debate on environmental, human and gender, energy, food, livelihood, health and water security concepts and policy problems. In 10 parts they discuss the context and the securitization of global environmental change and of extreme natural and societal outcomes. They suggest a new research programme to move from knowledge to

action, from reactive to proactive policies and to explore the opportunities of environmental cooperation for a new peace policy.

In the third volume approximately 100 chapters will address in part I: Introduction: Concepts of Security Threats, Challenges, Vulnerabilities and Risks; part II: Military and Political Security Threats, Challenges, Vulnerabilities and Risks; part III: Economic, Social, Environmental Security and Human Threats, Challenges, Vulnerabilities and Risks in the Near East, North and Sub-Sahara Africa and in Asia; part IV: Threats, Challenges, Vulnerabilities and Risks for Urban Centres in Hazards and Disasters; part V: Coping with Global Environmental Change: Climate Change, Soil and Desertification, Water Management, Food and Health; part VI: Coping with Hazards and Strategies for Coping with Social Vulnerability and Resilience Building; part VII: Coping with Global Environmental Change: Scientific. International and Regional Political Strategies, Policies and Measures; part VIII: A Technical Tool: Remote Sensing, Vulnerability Mapping and Indicators of Environmental Security Challenges and Risks; part IX: Towards an Improved Early Warning of Conflicts and Hazards and part X: Summary and Policy Conclusions.

These three related volumes of this major security handbook of the 21st century address the key new objective security dangers and subjective security concerns primarily posed by the newly perceived security threats, challenges, vulnerabilities and risks that are developing from problems related to global environmental change in this new age of earth history, for which the Nobel Laureate in Chemistry, Paul Crutzen, coined the term the 'Anthropocene'.

This project differs from traditional approaches in international relations of primarily mono-disciplinary, often Eurocentric or US-centred books that are also male dominated where authors representing the other five billion people on the globe are in most cases not represented as authors. Of the editorial team of 11 colleagues from 10 countries, three are women from India, Kenya and Mexico and in the second volume half come from the South.

On the background of the above project, this panel will address these new security dangers and concerns, the gradual change in the referent objects from the state and international organizations to human beings and/or humankind (*human security*) and of the securitizing actors from national defence and interior ministries to an global scientific epistemic community as represented by the IPCC.

2. Three Reasons for a Reconceptualization of Security

The first of the three volumes focuses on the *reconceptualization of security in the 21st century*[2] that has gradually evolved since the end of the East-West conflict (1989-1991) and that has been significantly influenced by processes of globalization and global environmental change.[3]

This global turn has resulted in the end of the Cold War (1946-1989), which some historians have interpreted as a 'long peace' (Gaddis 1987, 1997) with a highly armed bipolar international order, the collapse of the Soviet Union (1991) and of a competitive global ideology, system of rule and military superpower. These events brought about a fundamental and peaceful change in international order that made the reunification of Germany (1990) and of Europe with the Eastern enlargement of the EU (2004, 2007) possible.

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[2] This text can be downloaded free of charge from the website of Springer publishers at: < http://www.springer.com/cda/content/document/cda_downloaddocument/9783540759768-c1.pdf?SGWID=0-0-45-494882-p173775913>.

[3] This book has been presented at: <http://www.springer.com/law/environmental/book/978-3-540-75976-8> and at: < http://www.afes-press-books.de/html/hexagon_03.htm>. The list of content of this book is available at: <http://www.springer.com/law/ environmental/book/978-3-540-75976-8?detailsPage=toc>.

This turn has been portrayed either as a 'victory' of US superiority (Schweitzer 1994) or as an outcome of a 'political learning' (Grunberg/Risse-Kappen 1992) based on a new thinking ('*Perestroika*') of Gorbachev that contributed to the first major peaceful global change in modern history. This 'global turn' (1989-1991) has been the fourth major change since the French Revolution that was instrumental for the emergence of a new international order. Three previous turning points in modern history were the result of revolutions (1789, 1911-1918) and of wars (1796-1815, 1914-1918, 1931-1949) resulting in a systemic transformation.

This fourth peaceful turn triggered peaceful (Czechoslovakia) and violent disintegration of multi-ethnic states (USSR, Yugoslavia); it contributed to the emergence of 'failing' states (e.g. Somalia, Afghanistan) and to 'new wars' (Kaldor/Vashee 1997; Kaldor 1999; Münkler 2002, 2005).

Besides the events in Europe during 1989, events in other parts of the world had no similar impact on the new global (dis)order during the 1990's, e.g. the death of Mao Zedong (1976) and the economic reforms of Deng Xiaoping in China (1978-1990); the end of the dictatorships and the third wave of democratization in Latin America; and the many new wars in Africa due to weak, failing or failed states where warlords took over control in parts of West and Eastern Africa (Somalia), as well as in Asia (Afghanistan).

This introduction to the first volume aims at a mental mapping of the complex interaction between this most recent global structural change and conceptual innovation that have occurred in academia, in international organizations as well as in the declarations and statements of governments since 1990 up to spring 2007.[4]

Security is a basic *term* and a key *concept* in the social sciences that is used in intellectual traditions and schools, conceptual frameworks, and approaches. The term 'security' is associated with many different meanings that refer to frameworks and dimensions, apply to individuals, issue areas, societal conventions, and changing historical conditions and circumstances. Thus, security as an individual or societal political value has no independent meaning and is always related to a context and a specific individual or societal value system and its realization (Brauch 2008a).

Security is a societal value or symbol (Kaufmann 1970, 1973) that is used in relation to protection, lack of risks, certainty, reliability, trust and confidence, predictability in contrast with danger, risk, disorder and fear. As a social science concept, "*security* is ambiguous and elastic in its meaning" (Art 1993: 821). Arnold Wolfers (1962: 150) pointed to two sides of the security concept: "Security, in an *objective* sense, measures the absence of threats to acquired values, in a *subjective* sense, the absence of fear that such values will be attacked."

For the constructivists, security is *intersubjective* referring to "what actors make of it" (Wendt 1992, 1999). Thus, security depends on a normative core that can not simply be taken for granted. Political constructions of security have real world effects, because they guide action of policymakers, thereby exerting constitutive effects on political order (see Wæver 2008a, Baylis 2008; Hintermeier 2008). The 'security concept' has gradually widened since the 1980's (Krell 1981; Jahn/Lemaitre/Wæver 1987; Wæver/Lemaitre/Tromer 1989; Buzan/Wæver/de Wilde 1995, 1998; Wæver/Buzan/de Wilde 2007; Albrecht/Brauch 2008). For Wæver (1998, 2008a) security is the result of a speech act ('securitization'), according to which an issue is treated as: "an existential threat to a valued referent object" to allow "urgent and

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[4] It refers only briefly to the term and concept of security (1.2), to the contextual context: events, structures, concepts and action (1.3), to the theme of contextual change, conceptual innovation as tools for knowledge creation and action (1.4), to the drivers and centres of conceptual innovation (1.5), to four scientific disciplines: history, philosophy, social sciences, and international law (1.6), to the *Hexagon Series on Human and Environmental Security and Peace* and to the goal of the three related volumes (1.7), to the goals, structure, authors, and audience of this book (1.8) as well as to the expected audience of this book (1.9).

exceptional measures to deal with the threat". Thus, the "securitizing actor" points "to an existential threat" and thereby legitimizes "extraordinary measures".

'Security in an objective sense' refers to specific *security dangers*, i.e. to 'threats, challenges, vulnerabilities and risks' (Brauch 2003, 2005, 2005a) to specific *security dimensions* (political, military, economic, societal, environmental) and *referent objectives* (international, national, human) as well as *sectors* (social, energy, food, water), while 'security in a subjective sense' refers to *security concern*s that are expressed by government officials, media representatives, scientists or 'the people' in a speech act or in written statements (historical sources) by those who securitize 'dangers' as security 'concerns' being existential for the survival of the referent object and that require and legitimize extraordinary measures and means to face and cope with these concerns. Thus, *security concepts* have always been the product of orally articulated or written statements by those who use them as tools to analyse, interpret, and assess past actions or to request or legitimize present or future activities in meeting the specified security threats, challenges, vulnerabilities, and risks.

The Copenhagen School (Buzan/Wæver 1997; Wæver 1997; Buzan/Wæver/de Wilde 1998; Wæver/Buzan/de Wilde 2008), distinguished among five dimensions (*widening*: military, political, economic, societal and environmental), and five referent objects ('whose security') or levels of interaction or analysis (*deepening*: international, regional, national, domestic groups, individual). They did not review the *sectorialization* of security from the perspective of *national* (international, regional) and *human security* (Brauch 2003, 2005, 2005a; table 1.1).

Table 1.1: Vertical Levels and Horizontal Dimensions of Security in North and South

Security dimension ⇒ Level of interaction ⇓ (referent objects)	Military	Political	Economic	Environmental ⬇	Societal
Human ➜			Social, energy, food , health, livelihood threats, challenges and risks may pose a *survival dilemma* in areas with high vulnerability		
Village/Community/Society				⬇⬆	
National	"*S*ecurity dilemma of competing states" *(National Security Concept)*		"Securing energy, food, health, livelihood etc." (*Human Security Concept*) combining all levels of analysis & interaction		
International/Regional				⬇⬆	
Global/Planetary ➜					

Influenced by different worldviews, rival theories and mindsets, security is a key concept of competing schools of a) *war, strategic* or *security studies* from a realist perspective, and b) *peace and conflict research* from an idealist or pragmatic view (Albrecht/Brauch 2008). Since 1990, interparadigm debates emerged between traditional, critical, and constructivist approaches. Within the UN and NATO, different concepts coexist, a state-centred political and military concept, and an extended security concept with economic, societal, and environmental dimensions. A widening and deepening of the security concept prevailed in OECD countries, while other countries adhered to a narrow military concept.

Not only the scope of '*securitization*' (Wæver 1997, 1997a) has changed, but also the referent object from a 'national' to a 'human-centred' security concept, both within the UN system (UNDP 1994; UNESCO 1997, 1998, 1998a, 1999, 2001, 2003; UNU 2002; UNU-EHS 2004), and in the academic security community. In European security discourses, an 'extended' security concept is used by governments and in scientific debates (Buzan/Wæver/de Wilde 1998). Møller (2001, 2003) distinguished a 'national' and three expanded security concepts of

'societal, human, and environmental security'. Oswald (2001, 2007, 2008) introduced a combined 'human, gender and environmental' (HUGE) security concept (Table 1.2).

Table 1.2: Expanded Concepts of Security (Møller 2001, 2003; Oswald 2001)

Concepts of security	Reference object (security of whom?)	Value at risk (security of what?)	Source(s) of threat (security from whom/ what?)
National Security [political, military dimension]	The state	Sovereignty, territorial integrity	Other states, terrorism (substate actors)
Societal security [dimension]	Nations, societal groups	National unity, identity	(States) Nations, migrants, alien cultures
Human security	Individuals humankind	Survival, quality of life	State, globalization, GEC, nature, terrorism
Environmental security [dimension]	Ecosystem	Sustainability	Humankind
Gender security	Gender relations, indigenous people, minorities	Equality, identity, solidarity	Patriarchy, totalitarian institutions (governments, religions, elites, culture), intolerance

While since the 19th century the key 'actor' has been the state, it has not necessarily been a major 'referent object' of security which is often referred to as 'the people' or 'our people' whose survival is at stake (Brauch 2008a; Albrecht/Brauch 2008). From 1947 to 1989 national and military security issues became a matter of means (armaments), instruments (intelligence) and strategies (deterrence). Wæver (1995: 45) argued that environmental issues may pose threats of violent conflicts and that they may also put the survival of the people at stake (e.g. by forced migration) without a threat of war.

Whether a threat, challenge, vulnerability, and risk (Brauch 2005a, 2006) becomes an 'objective security danger' or a 'subjective security concern' also depends on the political context. While in Europe climate change has become a major security issue, in the US, during the administration of George W. Bush this problem was downgraded. Labelling climate change a security issue implies different degrees of urgency and means for coping with it.

The traditional understanding of security "as the absence of existential threats to the state emerging from another state" (Müller 2002: 369) has been challenged both with regard to the key subject (the state) and carrier of security needs, and its exclusive focus on the "physical – or political – dimension of security of territorial entities" that are behind the suggestions for a horizontal and vertical widening of the security concept.

The meaning of security was also interpreted as a reaction to globalization and to global environmental change. In Europe, several critical approaches to security gradually evolved as the *Aberystwyth* (Booth, Wyn Jones, William), *Paris* (Bigo, Badie) and *Copenhagen* (Wiberg, Wæver, Møller) schools that led to the development of a *New European Security Theory* (NEST, e.g. Bürger/Stritzel 2005) 'networked manifesto' (CASE 2006; Albrecht/Brauch 2008).

3. Securitization Theory and Methods of the First Volume

Political and scientific concepts, like security, are used within a complex context (Koselleck 2006). These concepts have a temporal and systematic structure, they embody and reflect the time when they were used and they are thus historical documents in the persistent change in the history of short events (*histoire des événements*) and long structures (Braudel's (1949, 1969, 1972) *histoire de la longue durée*). Concepts are influenced by manifold perceptions

and interpretations of events that only rarely change the basic structures of international politics and of international relations (IR).

The political events of 1989, the rare coincidence of a reform effort from the top and a yearning for freedom and democracy from the bottom, as part of a peaceful upheaval in East Central Europe toppled the Communist governments in all East Central European countries within three months, and thus were instrumental for the collapse of the Soviet Union and the dissolution of the Warsaw Treaty Organization and the Comecon (1991).

The Cold War bipolar order of two rival highly armed political systems with the capability to destroy the globe with its weapons of mass destruction based on nuclear deterrence doctrines became obsolete as well as the traditional security legitimizations with the arms of the other side. This structural change of the international order influenced the security policy agendas and provoked a global political and scientific debate on the reconceptualization of security. This debate has been global, stimulated by many policy actors, scientists and intellectuals. The results of this process are documented in the national security doctrines and strategies (e.g. in the US) and in defence white papers of many countries (e.g. in Germany 1994, 2006). They have also been an object of analysis of the scientific community that gradually emancipated itself from the US conceptual dominance (Wæver 2004; Wæver/Buzan 2006). But these Northern discourses on security have been unaware and ignored the thinking of the philosophical traditions in Asia, Africa, Latin America, and in the Arab world.

While Huntington in his 'clash of civilization' (1993, 1996) succeeded to 'securitize culture' from the vantage point of US national security interests and strategies, the critical responses (Said; Chomsky; Ajami) reflected the cultural and religious diversity of the other five billion people that have been primarily an object of security thinking and policy during and after the Cold War.

This reconceptualization of security has impacts on international agendas and thus on political action on many different levels. UNDP (1994) introduced a 'people-centred' human security concept that was subsequently promoted by the *Human Security Network* (as 'freedom from fear'), and by the *Human Security Commission* (as 'freedom from want'), to which Kofi Annan added as a third pillar: 'freedom to live in dignity' and the *United Nations University* (UNU) as the fourth pillar: 'freedom from hazard impact' (Bogardi/Brauch 2005; Brauch 2005, 2005a; Fuentes/Brauch 2008).

The increasing perception of global environmental change (GEC) as a 'threat' to the survival of humankind and the domestic backlash in the US against the narrow security concepts and policies of the Neo-cons has widely established a widened, deepened, and sectorialized security concept that increasingly reflects the existing cultural and religious diversity also in the political debate on security as well as in scientific discourses. In this context, this volume has a dual function: a) to map this global conceptual change; and b) to create a wide scientific and political awareness of the new threats, challenges, vulnerabilities and risks that often differ from the perception of the present political elite in the only remaining superpower.

Thus, conceptualizing security concepts and defining the manifold security interests and preferences, structures the public policy discourse and legitimates the allocation of scarce financial resources to 'face' and 'cope' with major security dangers and concerns that threaten the survival of states, human beings or humankind and thus require 'extraordinary' political action.

A key analytical question is to which extent the structural change in the global and regional international order was instrumental, triggered or contributed to this conceptual innovation and diversity in the global security discourse since 1990 or to which extent other events or regional or national structural changes have initiated a conceptual rethinking.

Major changes in the international order for the past 500 years have been:

- ➢ The *Hispanic World Order*: Expulsion of the Arabs and conquest of the Americas (1492-1618) by Spain and Portugal that resulted in a global order dominated by the Christian 'civilized world' that perceived the South as 'primitive barbarians';

- ➢ The *peace of Münster and Osnabrück* (1648) after the religious Thirty Years War (1618-1648), and the emergence of the Westphalian European order based on territorial states and an emerging international law;

- ➢ The *Utrecht Settlement* and the century of war and peace in the order of Christian princes (1715-1814).

After the independence of the United States (1776), the French Revolution (1789), and the wars of liberation in Latin America (1809-1824) and the emergence of many new independent states (1817-1839) in Europe four major international orders and major global structural and contextual changes can be distinguished:

- ➢ The *Peace Settlement of Vienna* (1815) and the European order of a balance of power based on a Concert of Europe (1815-1914) in an era of imperialism (Africa, Asia) and the post-colonial liberation in Latin America.

- ➢ The *Peace of Versailles* (1919) with a collapse of the European world order, a declining imperialism and the emergence of two new power centres in the US and in the USSR with competing political, social, economic, and cultural designs and a new global world order based on the security system of the *League of Nations* (1919-1939).

- ➢ The *Political Settlement of Yalta* (February 1945) and the system of the United Nations discussed at the Conferences in Dumbarton Oaks (1944), *Chapultepec* (January/ February 1945), and adopted at *San Francisco* (April/June 1945).

With these turning points during the European dominance of world history, the thinking on security changed. External and internal security became major tasks of the modern dynastic state. With the French Revolution and its intellectual and political consequences the thinking on '*Rechtssicherheit*' (legal predictability guaranteed by a state based on laws) gradually evolved. With the Covenant of the League of Nation '*collective security*' became a key concept in international law and in international relations (IR).

Since 1945, this 'national security' concept has become a major focus of the IR discipline that gradually spread from Aberystwyth (1919) via the US after 1945 to the rest of the world. The Cold War (1946-1989) was both a political, military, and economic struggle and an ideological, social, and cultural competition when the modern 'security concept' emerged as a political and a scientific concept in the social sciences that was intellectually dominated by the American (Katzenstein 1996) and Soviet (Adomeit 1998) strategic culture. With the end of the Cold War, the systemic conflict between both superpowers and nuclear deterrence became obsolete and its prevailing security concepts had to be reconsidered and adjusted to the new political conditions, security dangers, and concerns.

This process of rethinking or 'reconceptualization of security concepts' and 'redefinition of security interests' that was triggered by the global turn of 1989-1991 and slightly modified by the events of 11 September 2001 (Der Derian 2004; Kupchan 2005; Risse 2005; Müller 2005; Guzzini 2005) and the subsequent US-led 'war on terror' has become a truly global process.

The intellectual dominance of the two Cold War superpowers has been replaced by an intellectual pluralism representing the manifold intellectual traditions but also the cultural and religious diversity. In this and the two subsequent volumes authors representing the five billion people outside the North Atlantic are given a scientific 'voice' that is often ignored in the inward oriented national security discourses that may contribute little to an understanding of these newly emerging intellectual debates after the end of the Cold War.

There has been a certain parochialism within the IR discipline which made the perception of the global process of reconceptualization of security, and of new centres of conceptual innovation on security more difficult. But the thinking of the writers outside the North Atlantic and their different concerns matter in the 21st century when the centres of economic, political, and military power may shift to other parts of the world.

The drivers of the theoretical discourse on security and the intellectual centres of conceptual innovation have moved away from both Russia (after 1989) but gradually also from the United States. During the 1980's, the conceptual thinking on 'alternative security' or 'defensive defence' in Europe was looking for political and military alternatives to the mainstream deterrence doctrines and nuclear policies (Weizsäcker 1972; Afheldt 1976; SAS 1984, 1989; Brauch/Kennedy 1990, 1992, 1993; Møller 1991, 1992, 1995). It was a major intellectual force behind the independent 'peace movement' that called for both disarmament and human rights in both camps (e.g. END, 1980-1989).

Today, the discourses on security are no longer a primarily American social science (Crawford/Jarvis 2001; Hoffmann 2001; Nossal 2001; Zürn 2003). The critiques of peace researchers and alternative security experts in Europe during the 1970's and 1980's, but also new national perspectives during the 1990's, e.g. in France (Lacoste, Bigo, Badie), in the UK (Buzan, Booth, Smith, Rogers), Canada (Porter 2001), Germany (Albrecht, Czempiel, Senghaas, Rittberger) challenged American conceptualizations of national security. Since the 1990's in Southern Europe a re-emergence of geopolitics (France, Italy, Spain) could be observed. In other parts of the world a critical or new geopolitics school emerged (O'Tuahthail, Dalby) but also a spatialization of global challenges (ecological geopolitics or political geo-ecology). In Germany there has been a focus on progressing debordering, or deterritorialization of political processes (Wolf, Zürn) primarily in the EU while new barriers were directed against immigration from the South in both the US (toward Mexico) and in Europe (in the Mediterranean).

Groom and Mandaville (2001: 151) noted an "increasingly influential European set of influences that have historically, and more recently, informed the disciplinary concerns and character of IR" that have been stimulated by the writings of Foucault, Bourdieu, Luhmann and Habermas and from peace research by Galtung, Burton, Bouthoul, Albrecht, Czempiel, Rittberger, Senghaas, Väyrynen. Since the 1980's, the conceptual visions of African (Nkruma, Nyerere) and Arab leaders (Nasser), as well as the Southern concepts of self-reliance and Latin American theories of 'dependencia' of the 1960's and 1970's had only a minor impact on Western thinking in international relations and on security.

Since 1990 the new centres of conceptual innovation are no longer the US Department of Defence or the US academic centres in security studies in the Ivy League programmes. The effort by US neo-conservatives to reduce the global security agenda to weapons of mass destruction and to the 'war on terror' has also failed, and many scholars share the scepticism.

However, most journals on security studies (e.g. *International Security*) are produced in the US and the North American market is the biggest book market for the security related literature. Since 1990 new journals on IR and security problems have evolved elsewhere, and since 1992 the triennial pan-European Conferences on International Relations (ECPR) in Heidelberg (1992), Paris (1995), Vienna (1998), Canterbury (2001), The Hague (2004) and Turino (2007) have supplemented the Annual International Studies Association conferences in North America where the intellectual debates on both security, peace, environment, and development are taking place. In August 2005 ECPR and ISA with partners in other parts of the world organized the first world conference on international relations in Istanbul.

In the political realm, the US as the only remaining superpower – irrespective of its 48 per cent contribution to global arms expenditures (SIPRI 2006) – has lost its predominance to set and control the international security agenda and US scholars no longer set the theoretical,

conceptual, and empirical agenda of the scientific security discourse. In Europe and elsewhere new centres of intellectual and conceptual innovation have emerged in the security realm:

➢ In Europe, *Aberystwyth*, *Paris*, and *Copenhagen* have been associated with three new critical 'schools' on security theory (Wæver 2004).

➢ The *Copenhagen School* combined peace research with the Grotian tradition of the English School, integrating inputs from Scandinavian, British, German, and French discourses (Buzan/ Wæver/de Wilde 1997; Wæver/Buzan/de Wilde 2007).

➢ The *human security concept* was promoted by Mahub ul Haq (Pakistan) with the UNDP report of 1994 and then developed further with Japanese support by the *Human Security Commission* (2003) and promoted both by UNESCO and UNU globally.

➢ Civil society organizations in South Asia developed the concept of *livelihood security*.

➢ International organizations introduced the sectoral concepts of *energy* (IEA, OECD)*, food* (FAO, WFO)*, water* (UNEP) *and health* (WHO) *security* (see Hexagon vol. IV).

➢ In the US and Canada, and in Switzerland and Norway the concept of *environmental security* as security concerns emerged during the 1980's and 1990's.

➢ Since 1990 the epistemic community of the *Intergovernmental Panel on Climate Change* (IPCC) provoked a global scientific and policy debate on climate change.

➢ The *Earth System Science Partnership* (ESSP) and its four programmes: IHDP (*International Human Dimensions Programme*), IGBP (*International Geosphere-Biosphere Programme*), WCRP (*World Climate Research Programme*) and *Diversitas* and its project GECHS (*Global Environmental Change and Human Security*) resulted in global scientific networks that address new security dangers and concerns.

Trends in the *reconceptulization of security* that will be mapped in the Hexagon Series are:

➢ *widening*, *deepening*, and *sectorialization* of security concepts;

➢ shift of referent object from the state to human beings or humankind (*human security*);

➢ perception of *new security dangers* (threats, challenges, vulnerabilities, and risks) and *securitization* of new security concerns due to an articulation by national and international organizations, scientific epistemic communities, and an attentive public with a progressing decentralization and diversity of information control through the internet;

➢ search for new non-military strategies to face and cope with these newly perceived security dangers and concerns and new environmental dangers, hazards, and disasters that pose no classical security dilemma (Herz 1950, 1959, 1962) for states but a 'survival dilemma' (Brauch 2004, see chapter 42 in this volume) for people.

These new drivers and centres of conceptual innovation have fundamentally challenged the narrow state-focused security concept of the traditionalists and realists in the Cold War.

The history of concepts was instrumental for a major German editorial project on key historical concepts (Brunner/Conze/Koselleck 1972-1997). Koselleck (1979, 1989, 1994, 1996, 2000, 2002, 2006) addressed the complex interlinkages between the temporal features of events, structures, and concepts in human (societal) history but also the dualism between experience and concepts (Brauch 2008a).

Conze (1984: 831-862) reviewed the evolution of the meaning of the German concepts security ('Sicherheit') and protection ('Schutz') that evolved – based on Roman and Medieval sources – since the 17th century with the dynastic state and was closely linked to the modern state. Since 1648 internal security was distinguished from external security which became a key concept of foreign and military policy and of international law. During the 17th and 18th

centuries internal security was stressed by Hobbes and Pufendorf as the main task of the sovereign for the people.

In the American constitution, safety is linked to liberty. During the French Revolution the declaration of citizens' rights declared security as one of its four basic human rights. For Wilhelm von Humboldt the state became a major actor to guarantee internal and external security while Fichte stressed the concept of mutuality where the state as the granter of security and the citizen interact. Influenced by Kant, Humboldt, and Fichte the concept of the '*Rechtsstaat*' (legally constituted state) and *'Rechtssicherheit'* (legal predictability of the state) became key features of the thinking on security in the early 19th century (Conze 1984).

The concept of 'social security' gradually evolved in the 19th and 20th centuries, especially during F.D. Roosevelt's New Deal as a key goal to advance the security of the citizens: "the security of the home, the security of the livelihood, and the security of the social insurance." This was addressed in the *Atlantic Charter* of 1941 as "securing, for all, improved labour standards, economic advancement and social security." In 1948 social security became a key human right in Art. 22 of the General Declaration of Human Rights.

The 'national' security concept in the US resulted in the emergence of the American security system (Czempiel 1966), or of a national security state (Yergin 1977). It was used to legitimate a major shift in the mindset from the isolationism of the 1930's to the internationalism in the post-war years, i.e. from a fundamental criticism of military armaments to a legitimization of an unprecedented military and arms build-up and militarization of the mindset of post-war foreign policy elites.

The changes in the thinking on security and their embodiment in security concepts are also a semantic reflection of the fundamental changes as they have been perceived in different parts of the world and conceptually articulated in alternative or new and totally different security concepts. Competing securitization efforts of terrorism or climate change are behind the transatlantic and global security policy debate and the global scientific conceptual discourse.

In the social sciences, the security concept has been widely used in *political science* (Baylis 2008), *economics* (Mursheed 2008; Mesjasz 2008) that focus on different actors: on the political realm (governments, parliaments, public, media, citizens); on society (societal groups) and on the business community (firms, customers, economic and fiscal policies). In political science, the security concept has been used in its threefold context: *policy* (field of security policy), *politics* (process on security, military, and arms issues), and *polity* (legal norms, laws, and institutions on the national and international level). The US National Security Act of 1947 (Czempiel 1966, Brauch 1977) and its adjustments has created the legal and institutional framework for the evolution of the 'national security state', sometimes also referred to as a military-industrial complex (Eisenhower 1972). This evolution has been encapsulated in the US debate on the concepts of 'national' and since 2001 also 'homeland' security.

The evolution and systematic analysis of concepts has been a major task of political philosophy and of the history of ideas. In German several philosophical publications documented the contemporary philosophy and its concepts in its interrelationship to their historical structure and the sciences. From a philosophical perspective after the end of the Cold War, Makropoulos (1995: 745-750) analysed the evolution of the German concept 'Sicherheit' from its Latin and Greek origins and its evolution and transformation during the medieval period, after the reformation as a concept in theology, philosophy, politics and law, with a special focus on Hobbes, Locke, Wolff, Rousseau, Kant. In the 20th century he reviewed the prevention and compensation of genuinely social and technical insecurity as well as new social risks. While this article briefly noted the concept of 'social security' the key concept of 'national security' or the more recent concepts of 'human security' were not mentioned.

Since the 18th century the security concept was widely used in the context of constitutional or public law for the legal system providing '*Rechtssicherheit*' for the citizens in their engagement with the state. The concepts of 'international peace and security' have been repeatedly used in the Covenant and in the UN Charter where Art. 1,1 outlines its key purpose:

> to maintain international peace and *security*, and to that end: to take effective collective measures for the prevention and removal of threats to the peace … 2. to develop friendly relations among nations … 3. to achieve international cooperation … [and] 4. to be a centre for harmonizing the actions of nations in the attainment of these common ends.

Wolfrum (1994: 51) points to the subjective and objective elements of 'international security', the pursuit of which "implies a transformation of international relations so that every state is assured that peace will not be broken, or at least that any breach of the peace will be limited in its impact." In addition he referred to the "defining characteristic of the concept of collective security [as] the protection of the members of the system against a possible attack on the part of any other member of the same system," and he noted that "the distinction drawn between the concepts of collective security and collective self-defence has been blurred to some extent in practice, and it also has lost relevance with respect to the United Nations" because due to the universal nature of the UN system "any distinction based upon external or internal acts of aggression [have been rendered] meaningless."

4. Securitization of Global Environmental Change

4.1 The Year 2007: A Turning Point in the Conceptualization of Security?

The year 2007 was a turning point for the conceptualization of security. Throughout 2007 the *Intergovernmental Panel on Climate Change* (IPCC) released its *Fourth Assessment Report* (AR4), in Paris (29 January-1 February), working group I adopted its report on the *Physical Science Basis* (IPCC 2007) with a projected temperature increase of up to 6.4°C (most likely between 1.8.° and 4°C) and a sea level rise between 18 and 59cm until 2100, followed by the acceptance report of working group II on the *Impacts, Adaptation and Vulnerability* (IPCC 2007a) on 2-5 April 2007 in Brussels, of the report of working III on *Mitigation of Climate Change* (IPCC 2007b) on 30 April – 3 may 2007 in Bangkok and finally on 13-17 November in Valencia (Spain) the *AR4 Synthesis Report* (IPCC 2007c) was approved.[5]

On 17 April 2007, during the British Presidency the United Nations Security Council addressed for the first time climate change as an international security issue[6] and from 29 July to 2 August 2007 the UN General Assembly held a special thematic debate on *Climate Change as a Global Challenge*.[7] In June 2007, at the G-8 meeting in Heiligendamm (Germany) the heads of states and/or governments agreed … "in setting a global goal for emissions reductions" that they will "consider seriously the decisions made by the European Union, Canada and Japan which include at least a halving of global emission by 2050."[8] Thus, climate change, as an

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[5] These meetings have been documented on the IPCC website; at: < http://www.ipcc.ch/press/index.htm>.

[6] See: "Press Conference by Security Council President, 4 April 2007"; at: <http://www.un.org/News/briefings/ docs //2007/070404_Parry.doc.htm>; [6] Bloomberg news: "UN attacks climate change as threat to peace", in: *International Herald Tribune,* 18 April 2007: 2; UN Security Council, SC/9000, 5663rd meeting, 17 April 2007: "Security Council holds first-ever debate on impact of Climate change on peace, security, hearing 50 speakers"; at: <http://un.org/news/press/_docs/2007/_sc9000.doc.htm>; Reuters: "UN Council Hits Impasse over Debate on Warming", in: *New York Times,* 18 April 2007; Edith M. Lederer: "Security Council Tackles Climate Change", in: *Washington Post,* 18 April 2007.

[7] See: Chris Spence, edited by Pamela Chasek: "Summary Of The Informal Thematic Debate Of The UN General Assembly on Climate Change as a Global Challenge"; at: < http://www.iisd.ca/climate/unga/ UNGA%20Climate%20Change%20briefing%20note.pdf>

[8] For the documents of the G 8 Meeting in Heiligendamm, Germany on 8 June 2007; at: < http://www.g-8.de/ Webs/G8/_EN/G8Summit/SummitDocuments/summit-documents.html > and the chair's conclusions; at: <

aspect of global environmental change, was increasingly addressed as a new objective security danger and subjective security concern for the livelihood and survival of humankind in this century.

On 12 October 2007, the Norwegian Nobel Committee awarded the Nobel Peace Prize to both the IPCC and to Al Gore "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change". On 10 December 2007, in his acceptance speech for the IPCC, its chairman, Rajendra Pachauri noted that this award is

an acknowledgement of three important realities, which can be summed up as:

1) The power and promise of collective scientific endeavour, which, as demonstrated by the IPCC, can reach across national boundaries and political differences in the pursuit of objectives defining the larger good of human society.
2) The importance of the role of knowledge in shaping public policy and guiding global affairs for the sustainable development of human society.
3) An acknowledgement of the threats to stability and human security inherent in the impacts of a changing climate and, therefore, the need for developing an effective rationale for timely and adequate action to avoid such threats in the future.

He referred to the complex linkage between climate change and its severe impacts on some of "the poorest and the most vulnerable communities in the world" that "see a decline in their economic condition, with a loss of livelihoods and opportunities to maintain even subsistence levels of existence." But due to its mandate, the IPCC did not assess "how conflicts inherent in the social implications of the impacts of climate change could be avoided or contained."

But he also noted that the "Fourth Assessment Report provides scientific findings that other scholars can study and arrive at some conclusions on in relation to peace and security." Pachauri suggested that "it would be particularly relevant to conduct in-depth analysis of risks to security among the most vulnerable sectors and communities impacted by climate change across the globe." He defined peace "as security and the secure access to resources that are essential for living" where climate change affects some populations to access a) clean water (*water security*), b) sufficient food (*food security*), c) stable health conditions (*health security*), d) ecosystem resources (*environmental* or *ecological security*), and e) security of settlements (*urban security*). The knowledge that was assessed by the IPCC provides a basis for the analysis in the social sciences as to how "climate change will affect peace" and whether its impacts could become a source of conflict (Brauch 2002). Citing from Willy Brandt's Nobel Peace Prize lecture in 1971, Pachauri argued "…next to reasonable politics, learning is in our world the true credible alternative to force." He concluded that "human ingenuity and strength are capable of meeting this challenge" by acknowledging "the importance of sustainable development as the path to peace and prosperity" that was stressed in the Brundtland Report (1987) that has also launched the policy debate on environmental security.

Thus, the Norwegian Nobel Committee with its award of the Nobel Peace Prizes in 2004 to *Wangari Muta Maatthai* (Kenya) as the first woman from Africa "for her contribution to sustainable development, democracy and peace", in 2006 to *Muhammad Yunus* and the *Grameen Bank* (Bangladesh) "for their efforts to create economic and social development from below" and to the IPCC and Al Gore in 2007 emphasized the close conceptual relationship of peace and security with development and the environment or among the four components of a "conceptual quartet" (Brauch 2008a).

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http://www.g-8.de/nsc_true/Content/EN/Artikel/__g8-summit/anlagen/chairs-summary,templateId=raw,property=publicationFile.pdf/chairs-summary>.

During 2007, climate change has been perceived and addressed – in many parts of the world – although not by all governments, as a major security threat, challenge, vulnerability and risk (Brauch 2005. 2005a) and in this process of 'securitization'[9] of problems of global environmental change, the IPCC has indirectly – in the public perception worldwide – become a major 'securitizing actor' by upgrading climate change to an "existential threat" to different referent objects from the international community (*global, international* and *regional security*), the state (*state* or *national security*) and humankind (*human* and *gender security*).

Addressing *global environmental change* (GEC) and *climate chang*e (CC) as a new objective security danger and subjective security concern takes note of the fundamental reconceptualization of security that is reflected in the *widening* (from a narrow political and military to economic, societal and environmental dimension), *deepening* (from a state-centred to a human-centred perspective or from the 'state' to the 'people' as referent objects of securitization; thus from '*national*' to '*human*' security) and the *sectorialization* of security with applications of this concept to energy, food, health, livelihood and water as well as those related to climate, soil, population and urbanization (Albrecht/Brauch 2008; Brauch 2008, 2008a, 2008b, 2008c).

4.2 The Scientific Basis: Research on Global Environmental and Climate Change: The IPCC as a Securitizing Actor

The environmental debate has gradually evolved since the 1950's, and since the 1970's, *global environmental change* (GEC) has focused on "human-induced perturbations in the environment" that encompass "a full range of globally significant issues relating to both natural and human-induced changes in the Earth's environment, as well as their socio-economic drivers." According to Munn (2002: xi) "changes greater than humankind has experienced in its history are in progress and are likely to accelerate." Dealing with future environmental trajectories requires more than a prediction of a single future path. It requires to "map a broad range of future environmental trajectories" that may confirm "that the changes of the 21st century could be far greater than experienced in the last several millennia" (Munn 2000: xii). Scientists, but also decision makers and administrators are challenged to think the unthinkable, to minimize 'surprise' should nature manifest itself.

Since the 1990's, besides the *International Geosphere-Biosphere Programme* (IGBP), the *International Human Dimensions Programme* (IHDP), the *World Climate Research Programme*

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[9] A theory of securitization has been developed by Ole Waever (1995. 2008, 2008a) and the Copenhagen School (Buzan/Waever/de Wilde 1998; Waever/Buzan/de Wilde 2008). Waever (2008a: 582) defined: "Securitization is the discursive and political process through which an intersubjective understanding is constructed within a political community to treat something as an existential threat to a valued referent object, and to enable a call for urgent and exceptional measures to deal with the threat. Other central concepts in the theory are 'referent object' (that which is deemed threatened and holds a general claim on 'having to survive', e.g. the state, the environment or liberal values), 'securitizing actor' (the one who makes the claim – speech act – of pointing to an existential threat to this referent object and thereby legitimizing extraordinary measures, often but not necessarily to be carried out by the actor itself), and 'audience' (those who have to be convinced in order for the speech act to be successful in the sense of opening the door to extraordinary measures, otherwise not available). The central idea of the theory is, that it is not up to analysts to try to settle the 'what is security?' question – widening to include the environment or narrowing to only military security – but more usefully one can study this as an open, empirical, political and historical question: who manages to securitize what under what conditions and how? And not least: what are the effects of this? How does the politics of a given issue change when it shifts from being a normal political issue to becoming ascribed the urgency, priority and drama of 'a matter of security'. Much of the elaboration of this theory (Wæver/Buzan/Kelstrup/ Lemaitre 1993; Buzan/Wæver/de Wilde 1998; Wæver/Buzan/de Wilde 2007) has taken place through exploring the particular dynamics and characteristics of security within the different 'sectors' of security: economic, environmental, political, military and … societal. .. Useful introductions to the theory, especially for those with more difficult access to these publications, can be found at: <http://polforsk.dk/download/securitytheory2006/homepage> (notably the paper 'Securitization: Taking Stock of a Research Programme')."

(WCRP), and *DIVERSITAS* were instrumental for rallying a global environmental change research community around coordinated scientific projects, and sensitizing policy-makers and the public alike (Brauch/Oswald Spring/Mesjasz/Grin/Kameri-Mbote/Chourou/Dunay/Birkmann 2009).

The human dimension of global environmental change covers both the contribution and the adaptation of societies to these changes. These processes pose many questions for social, cultural, economic, ethical, and even spiritual issues, e.g. for our role and responsibility with regard to the environment. Wilson (1998) noted a growing *consilience* (the interlocking of causal explanations across disciplines) in which the "interfaces between disciplines become as important as the disciplines themselves" that would "touch the borders of the social sciences and humanities".

Global (environmental) change deals with changes in nature and society that have affected humankind as a whole and will increasingly affect human beings who are both a cause of this change and often also a victim. However, those who have caused it and those who are most vulnerable to and affected by it are not always identical. Global change affects and combines the ecosphere and the anthroposphere. The *ecosphere* comprises the *atmosphere* (climate system), the *hydrosphere* (water), the *lithosphere* (earth crust, fossil fuels), the *pedosphere* (soil), and the *biosphere* (life), while the *anthroposphere* deals with populations, social organizations, knowledge, culture, economy and transport, and other human-related systems (WBGU 1993).

More recently, Steffen, Sanderson, Tyson, Jäger, Matson, Moore, Oldfield, Richardson, Schellnhuber, Turner and Wasson (2004: 1) have argued that a global perspective on the interactions between environmental change and human societies has evolved. This led to an awareness of two aspects of Earth System functioning: "that the Earth is a single system within which the biosphere is an active, essential component; that human activities are now so pervasive and profound in their consequences that they affect the Earth at a global scale in complex, interactive and apparently accelerating ways." They have further argued "that humans now have the capacity to alter the Earth System in ways that threaten the very processes and components, both biotic and abiotic, upon which the human species depends."

In the social sciences, the analysis of global environmental change and human-nature relationship is polarized between epistemological idealism and realism (Glaeser 2002: 11-24), or between *social constructivism* and *neo-realism*. The *neo-idealist orientation* has highlighted two aspects: a) the uncertainty of scientific knowledge and claims; and b) the attempt to explain the scientific and public recognition of environmental change influenced by political and historical forces (Rosa/Dietz 1998). At least three standpoints exist on environmental issues:

- a *pessimist* or *Neo-Malthusian view* stimulated by Malthus' Essay on Population (1798) that stressed the limited carrying-capacity of the Earth to feed the growing population;

- an *optimist* or *Cornucopian view* that believed an increase in knowledge, human progress and breakthroughs in science and technology could cope with these challenges (table 1.3).

These two opposite positions have dominated the environmental debate since the Club of Rome's *Limits of Growth* (Meadows 1972), and Lomborg's (2001) *Skeptical Environmentalist*. Homer-Dixon (1999: 28-46) distinguished among *neo-Malthusians* (biologists, ecologists); *economic optimists* (economic historians, neoclassic economists, agricultural economists) and *distributionists* (poverty, inequality, misdistribution of resources). Brauch (2002, 2003) opted for a third perspective of an *equity-oriented pragmatist*. Table 1.3 combines

- the three worldviews on security of the English school (Brauch 2008, 2008a) along with

- three ideal-type standpoints on the environment.

This leads to nine combined ideal type positions on security and environmental issues. That of the United Nations system (position V) may be described as that of Grotian pragmatism in security terms and as an equity oriented pragmatic environmental perspective where 'co-operation matters' and is needed to solve problems.

Table: 1.3: Worldviews and Standpoints on Security and Environmental Issues: **Source:** Brauch 2003, 2005, 2005a).

Worldviews/Traditions on security (→) Standpoints on environmental issues (↓)	Hobbes, Morgenthau, Waltz (neo)realist (pessimist) *Power matters*	Grotius liberal pragmatist *Cooperation matters*	Kant Neo-liberal institutionalist (optimist) *International law matters and prevails*
Neomalthusian pessimist *Resource scarcity*	I	II	III
Equity-oriented pragmatist *Cooperation will solve problems*	IV	V International organizations and regimes	VI
Cornucopian neo-liberal optimist. *Technological ingenuity will solve problems*	VII	VIII	IX

The complex interaction between processes in the ecosphere and anthroposphere have been visualized by Brauch (2002, 2003, 2005. 2005a) in a 'survival hexagon' of three resource challenges: *air* (climate change), *land* (soil, ecosystem degradation), and *water* (scarcity, degradation, floods) and the following three social challenges: *human population* (growth, changes of its value systems), *urban systems* (services, industries, pollution, health) and *rural systems* (securing food and fibre).

These six factors may interact in different ways and contribute to environmental scarcity of soil, water and food that in turn intensify environmental degradation and result, taking the specific national and international context into account, in environmental stress that may lead – under certain socio-economic conditions and specific national and international contexts – to conflictual outcomes nearly exclusively at the national level, but only in rare cases they may affect neighbouring countries. These may be resolved, prevented or avoided primarily by national political decisions and supported in some cases by diplomatic efforts. Whether environmental stress results in extreme and potentially violent outcomes depends on the national *political process* (interaction between state, society, and economy but also how knowledge is used for adaptation and mitigation purposes), and on the structures of governance. This complex causal interaction between anthropogenic triggers, natural processes and human and societal impacts will be discussed below (Brauch 2005x, 2008x) for the PEISOR model.

While a theoretical linkage between the burning of hydrocarbons and global warming was first postulated in 1896 by the Swedish physicist and chemist Svante Arrhenius (v. Weizsäcker/LovinsLovins 1995: 249; Brauch 1996: xxviii) but it took until 1979 when the first world climate conference was organized by the *World Meteorological Organization* (WMO). Several scientific meetings followed in 1983, 1985 and 1987 in Villach (Austria) and Bellagio (Italy) that were carried out by WMO in cooperation with the *United Nations Environment Programme* (UNEP) and the *International Council of Scientific Unions* (ICSU), and in 1985 participants from 29 industrialized and developing countries warned for the first time of a danger of an anthropogenic climate change.

In autumn of 1988, the U.S. Reagan Administration added climate change on the policy agenda of the G-7 in Toronto where a few weeks later some 300 scientists and policy-makers at

the "World Conference on the Changing Atmosphere, implications for Global Security" suggested in their final declaration a reduction of CO_2 emissions by 20 per cent between 1988 and 2005 (Oberthür 1993). In November 1988, UNEP and WMO established the *Intergovernmental Panel on Climate Change* (IPCC) and in December 1988, at the suggestion of Malta, the UN General Assembly declared the atmosphere as being "a common heritage of mankind" (GA/43/53) and two years later on 21 December 1990, the General Assembly set up the *International Negotiating Committee on Climate Change* (INC) with a mandate to negotiate the *United Nations Framework Convention on Climate Change* (UNFCCC) that was adopted in June 1992 at the Rio Earth summit on *Environment and Development* (UNCED) and five years later with the adoption of the *Kyoto Protocol* (KP) the first binding quantitative emissions reductions were adopted that will expire with the end of the 2008-2012 commitment period and is to be replaced by an emerging post-2012 climate change regime (Ott 2007).[10]

Thus, since 1988 climate change has increasingly become an urgent policy issue and was thus 'politicized' and since the turn of the century, climate change has gradually been perceived and discussed as an international (Brauch 2002), national (Schwartz/Randall 2003) and human security issue (Wisner et al. 2007) security or has been 'securitized'. In a similar vein, issues of water scarcity, degradation and stress and soil degradation and desertification have progressively been politicized and also since a NATO conference in Valencia also securitized. Thus, facing global environmental change has increasingly been perceived and addressed as an emerging soft security issue.

Thus, during the past two decades, *global environmental challenges* (Brauch/Oswald Spring/Mesjasz/Grin/Dunay/Behera/Chourou/Kameri-Mbote/Liotta 2008) have created an intensive public awareness to *fac*e this global environmental change (Brauch/Oswald Spring/Grin/Mesjasz/Kameri-Mbote/Behera/Chourou/Krummenacher 2008) and to *cope* with its consequences (Brauch/Oswald Spring/Mesjasz/Grin/Kameri-Mbote/Chourou/Dunay/Birkmann 2009). As has already been argued, this reconceptualization of security since 1990 was due to: a) the end of the Cold War (1989/1990), b) the process of globalization, and c) and the impact of GEC or what Crutzen (2002; Crutzen/Stoerme 2000; Clark/Crutzen/Schellnhuber 2005) has termed as a shift in earth history from the Holocene to a new Anthropocene (Brauch 2008, 2008a, 2008b, 2008c; Albrecht/Brauch 2008; Oswald/Brauch/Dalby 2008).

During the past two decades both the scientific discourse and the policy debates on problems of global environmental change and on the reconceptualization of security were pursued by different scientific and policy communities, by environmental epistemic communities and by the debates on peace and security. Within the GEC-community, in the framework of the IHDP its project GECHS (*Global Environmental Change and Human Security*) has argued that the following types of environmental change affect *human security*: a) natural disasters, b) cumulative changes or slow-onset changes, c) accidental disruptions or industrial accidents, d) development projects, and e) conflict and warfare (GECHS 1999).

The *United Nations University Institute on Environment and Human Security* (UNU-EHS year; Bogardi/Brauch 2004; Brauch 2005, 2005a) in Bonn has developed the environmental dimension of human security further. From its perspective, the improvement of human security, particularly the improvement of the environmental dimension of human security, requires a better understanding of the various forms of vulnerability in different societies, their economies and of the environmental conditions for hazards of natural origin as well as with regard to creeping environmental degradation that impact on the vulnerability and the hazard components. Bogardi and Brauch (2005) suggested that human security should rest on three pillars reflecting the corresponding pillars of sustainable development:

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[10] The negotiations are documented at the website of the UNFCCC secretariat; at: <http://unfccc.int/2860.php>.

- *'Freedom from want'* (economic and societal security dimensions) by enhancing the implementation of the millennium development goals through active development and environment policies aiming at sustainable development by reducing *social vulnerability* through poverty eradication programmes (UNDP 1994; CHS 2003);

- *'freedom from fear'* (political and military security dimension) by reducing the probability that people become victims of violence and conflict and by enhancing human rights;

- *'freedom from hazard impacts'* (environmental security dimension) by reducing vulnerability of societies confronted with natural and human-induced hazards and by enhancing resilience, disaster preparedness and response (UNU-EHS 2005; Brauch 2005).

A major task for UNU-EHS (2004) has been to develop the third component of the human security concept, and to contribute to the implementation of this goal through capacity-building for early warning, developing vulnerability indicators, and vulnerability mapping. While human-induced and natural hazards cannot be prevented, the impact of these tragic events can be reduced by both measures of early warning and better disaster preparedness. 'Freedom from hazard impact' would imply that people can mobilize their resources to address sustainable development goals rather than remain in the vicious cycle of the survival dilemma (Brauch 2004, 2008c). To achieve this goal requires four hazard-specific policies and a combination of technical, organizational and political measures in case of:

- *Slow-onset hazards*: sea-level rise and temperature increase due to climate change require a) long-term strategies for *reducing greenhouse gas emissions*, b) measures of *adaptation* (dams in affected areas), and c) *mitigation* (restriction of housing in coastal areas);

- *Rapid-onset hydro-meteorological hazards*: Climate change has contributed to an increase of extreme weather events. This requires *disaster preparedness* (education, training, and infrastructure) and *disaster response* on the national and international level. Different early warning systems are needed for storms (early warning centres, infrastructure), floods (vulnerability mapping), forest fires (monitoring from space and plains), and droughts (precipitation monitoring from satellites);

- *Rapid-onset geophysical hazards*: earthquakes, tsunamis, volcanic eruptions and their possible extreme consequences require improved early warning systems (closer cooperation among seismic and volcanic research centres, tsunami early warning systems), better disaster preparedness (vulnerability mapping), improved national and international disaster response and clear guidelines for post hazard reconstruction activities;

- *Human induced disasters*: technical (malfunctioning of technical systems, collapse of buildings, dams), industrial (e.g. chemical industry, nuclear reactors) and traffic accidents (road, railway, ships, airplanes etc.) as well as *intentional malicious acts* by states in war (attacking objects containing dangerous forces, dams, energy and chemical plants) and by non-state societal (terrorists) and economic (organised crime) actors or a combination of these.

'Human security as freedom from hazard impact' is achieved when people who are vulnerable to and at risk of these manifold environmental hazards and disasters (floods, landslides, and drought) that are often intensified by other associated societal threats (poverty), challenges (food insecurity), vulnerabilities and risks (improper housing in highly vulnerable flood-prone and coastal areas) are better warned of impending hazards, prepared and protected against these impacts and are empowered to prepare themselves effectively to cope with the 'survival dilemma' (Brauch 2000, 2004, 2005, 2008). Such extreme events often pose for the most vulnerable three 'no-win' alternatives: a) to die, b) to be forced to migrate, or c) to struggle for their own survival and that of their community. During the Greek Presidency (2007/2008)

the *Human Security Network* (HSN) will for the first time explore the environmental dimension of human security (Fuentes/Brauch 2008).

These two specific approaches of GECHS and UNU-EHS have addressed both the input factors and the often extreme outcomes from the vantage-point of a people-centred human security approach. However, the rapidly emerging policy debate on global environmental change and security has focused only at one of several challenges posed by *climate change* for (primarily U.S.) *national security* or (primarily in the UN framework) on *international* (regional and global) *security*, thus more ore less ignoring the other challenges referred to in the survival hexagon: water and soil on the supply side and population, urban and rural systems (*food security*).

With the end of the East-West Conflict (Cold War) since the *UN Conference on Environment and Development* (UNCED) in Rio de Janeiro (1992) and the *World Summit on Sustainable Development* (WSSD) in Johannesburg (2002) *global environmental change* (GEC) posed by climate change, water stress and soil erosion and desertification have been added to the international policy agenda and since the turn of the millennium they have increasingly been addressed and perceived as new security threats, challenges, vulnerabilities and risks.

5. Securitization Water and Water Security Concepts

The concept of 'water security' was introduced in the Ministerial Declarations of the Second and World Water Forum in The Hague (2000) and developed further at the Third World Water Forum in Kyoto (2003) and at the Fourth World Water Forum in Mexico City (2006).[11]

Since 2000, the concept of water security has been widely used by water specialists in the natural and social sciences, by policy makers and international organizations. The 2nd World Water Forum in 2000 launched *The African Water Vision* that is "concerned with the equitable and sustainable use of Africa's water resources for poverty alleviation, socio-economic development, and regional integration. It seeks to address the water paradox of the continent (floods and droughts, water scarcity and under-exploited water resources). The Vision also seeks to address the sustainable supply of water to meet the requirements of food and energy security and improved access to safe drinking water and adequate sanitation." [12]

The 'Mexico Ministerial Declaration On Water' of 17 March 2006 emphasized the goal of achieving water security by stating that "to improve water security, African countries need to invest in water infrastructure up to the level where they can, in order to achieve a self-sustaining auto–induced growth to eradicate poverty and achieve sustainable development." The "Concept Note for the First African Water Week" (AWW) from 26 to 28 March 2008 outlined a strategy for "Accelerating Water Security for Socio-economic Development of Africa." This note defined water security as:

> the capacity to provide sufficient and sustainable quantity and quality of water for all types of water services (drinking, sanitation and health, food production, energy, industry, ecosystem protection) and protect society and the environment from water-related disasters. This is of crucial importance as the world is already facing severe water shortages in many parts of the developing world and the problem will only become more widespread in the years ahead with climate change.

The first *African Water Week* discussed the global and regional experience with water security and socio-economic development, reflecting on Africa's positive and negative experience and

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[11] See "Water Security in the 21st Century", Ministerial Declaration, Second World Water Forum, The Hague, 22 March 2000, para.3, available at: <http://www.thewaterpage.com/hague declaration.htm>; Ministerial Declaration, Third World Water Forum, Kyoto 23 March 2003, para.11, available at: <http://www.mofa.go. jp/policy/environment/wwf/ declaration.html>.

[12] See the African Development Bank; at. < http://www.afdb.org/pls/portal/docs/PAGE/ADB_ADMIN_PG/DO-CUMENTS/NEWS/CONCEPT%20NOTE-ENG.PDF>,

on the impact of climate change and variability on Africa's water resources. Among the water security challenges it addressed the sanitation gap and the strategies for closing it, as well as on infrastructure for water security. Similar strategies have been developed in many Latin American and Asian countries.

6. The Hot Issue: Securitization of Climate Change

While security specialists and peace researchers have for a long time totally ignored the impact climate change may have on peace and security, climate specialists in the natural sciences avoided to consider these challenges in a security framework. Since the early 21st century climate change has increasingly been perceived as a threat to 'national', 'international', and 'human security'. Climate change has gradually been securitized in government reports and in statements of government officials in the United Kingdom, in Germany (BMU 2002; Brauch 2002, 2003e, 2004, 2006a; WBGU 2007, 2007a, 2008), and in the US (Schwartz/Randall 2003, 2004; Purvis/Busby 2004; O'Keefe 2005; CNA 2007).

At the request of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, this author (Brauch 2002) addressed the linkages between climate change and conflict focusing on the policy question whether climate change impacts increase conflict potentials? The political goal was to sensitize the IPCCC to include an assessment of the policy and security implications in the Fourth Assessment Report (AR4) what has not been done due to its mandate, as the IPCC chairman explained in his Nobel Peace Prize acceptance speech.

The first conceptual and empirical articles and studies addressed "climate change, worst-case scenarios of climate change in the Southwest Pacific" (Edwards 1996, 1999), "climate change and world food security" (Parry/Rosenzweig/Iglesias/Fischer/Livermore 1999), "climate change and violent conflicts (Rahman 1999), "linking climate change research with food security and poverty reduction in the tropics" (Sanchez 2000), "from climate risk to climate security (Wiman/Stripple/Chong 2000), "security and climate change" (Barnett 2001), "climate change as a security issue" (Stripple 2002) and "climate change, environmental stress and conflict" (Brauch 2002).

Since 2002, 'securitization of climate change' has gradually emerged and it got on the policy agenda when a contract study by Randall and Schwartz (2003) for the U.S. Defense Department was leaked in February 2004 that stimulated a heated policy discussion in the U.S. that was further fuelled by a documentary "The Day After Tomorrow: Could it Really Happen" on the impact of an abrupt climate change (NAS 2001).

Especially since 2007 several policy-oriented studies have securitized climate change from different vantage points and concepts of security by analyzing climate change as:

o an *international security* threat, challenge, vulnerability and risk;
o a *national security* threat for the United States and as
o a *human security* challenge that will affect the highly socially vulnerable poor population.

The security danger posed by climate change "can be captured by measuring different variables, such as the concentration of greenhouse gases in the atmosphere, regional and planetary energy balances of global surface mean temperature" but this does "not automatically imply a societal relevance" (Storch/Stehr 1997: 66) or an extreme or fatal outcome (Brauch 2002, 2005, 2005a). Climate change due to sea-level rise increases the vulnerability of small islands and coastal regions and it has severe impacts on agriculture, health and tourism and other economic sectors.

In analyzing climate change as a security issue Stripple (2002: 115-119) addressed the policy efforts for "securing a stable climate or maintaining a rate of change below the levels for

human and ecological systems" (Art. 2, UNFCC), its security impacts at the global and regional level, as well as climate security complexes as represented by the *Alliance of Small Island States* (AOSIS) that refers both to a new challenge but also a new type of climate security cooperation.

6.1 Climate Change as an International Security Danger and Concern

At the Pacific Institute (California, USA), since the late 1980's Peter Gleick addressed the links between climate and international security arguing that the impacts of anthropogenic climate change "will be complex and challenging", and that

> global climate change will potentially alter agricultural productivity, freshwater availability and quality, access to vital minerals, coastal and island flooding, and more. Among the consequences of these impacts will be challenges to political relationships, realignment of energy markets and regional economies, and threats to security. There is debate about the extent to which resource constraints or environmental problems alone can lead to conflict. However, it is widely acknowledged that resource constraints can lead to economic pressures and tensions or as triggers to conflicts when other tensions exist between states or political actors. These challenges, together with the long history of political frictions and disputes worsened by environmental stresses, suggests that global climatic changes have the potential to exacerbate international and subnational tensions and conflicts. The Pacific Institute has … published a series of analyses of the relationship between climate and security beginning in the late 1980's. In an ongoing effort to understand the connections between climate change and international security, the Pacific Institute will continue to publish and analyze the links between climate and conflict.[13]

In his report for the German Environment Ministry, Brauch (2002) focused on: the causes of climate change and its complex interactions with other drivers of global environmental change; the environmental factors that contribute to environmental stress as a driver that may cause or trigger a conflict; potential conflictual or cooperative outcomes of environmental stress; he discussed the results of these considerations in five cases studies on small island states, Mexico, Bangladesh, Egypt and for the Mediterranean, and he drew conceptual conclusions for scientific considerations and strategies aiming at conflict prevention.

From a state-centred international security perspective, the *German Advisory Council on Global Change* (WBGU 2007/2008) reviewed the scientific research on '*Climate Change as a Security Risk*'. The report argued that

> without resolute counteraction, climate change will overstretch many societies' adaptive capacities within the coming decades. This could result in destabilization and violence, jeopardizing national and international security to a new degree. However, climate change could also unite the international community, provided that it recognizes climate change as a threat to humankind and soon sets the course for the avoidance of dangerous anthropogenic climate change by adopting a dynamic and globally coordinated climate policy. If it fails to do so, climate change will draw ever-deeper lines of division and conflict in international relations, triggering numerous conflicts between and within countries over the distribution of resources, especially water and land, over the management of migration, or over compensation payments between the countries mainly responsible for climate change and those countries most affected by its destructive effects. … [This report] is based on the findings of research into environmental conflicts, the causes of war, and of climate impact research. It appraises past experience but also ventures to cast a glance far into the

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[13] See the testimony of Peter H. Gleick to the United States Congress, Committee on Government Reform Subcommittee on National Security, Emerging Threats, and International Relations, Hearing on Energy as a Weapon: Implications for U.S. Security: "The Implications of Global Climatic Changes for International Security", 16 May 2006; Peter H. Gleick: "Global Climatic Change and International Security" (1989); at: http://www.pacinst.org/reports/climate_reports/Global_Climatic_Change_and_International_Security.pdf; Peter H. Gleick: "The implications of global climatic changes for international security", in: *Climatic Change*, 15 (1989): 309-325.

future in order to assess the likely impacts of climate change on societies, nation-states, regions and the international.[14]

Achim Steiner, UN Under-Secretary General and Executive Director, *United Nations Environment Programme* (UNEP) stated that "the report makes it clear that climate policy is preventative security policy."

A background paper for the 'International Women Leaders Global Security Summit' in November 2007 in New York[15] put forward "a new security agenda that views the safety of people as inseparable from the security of the state" focusing on "four important themes of global security: climate change, the responsibility to protect, the economics of insecurity and preventing terrorism(s)." The Report summarized the results stated on climate change:

> Climate change poses significant security risks due to an increased occurrence of severe weather patterns, degradation of vital natural resources and threats to the livelihoods and safety of populations on every continent. Pressure on resources, natural disasters and humanitarian crises – including flooding, drought, desertification and loss of arable land, massive and rapid migration and refugee flows – have the potential to threaten economic, political and social stability while increasing the risk of internal civil unrest. Poor and underdeveloped communities and countries are particularly vulnerable and yet are marginalized in international negotiations on climate policy. An absence of political will on the part of developed nations to accommodate more comprehensive policy changes may meet with increasing resentment from those countries most vulnerable to the effects of climate change. Thus, it is imperative to take action now to decrease the momentum of climate change. Women's leadership must help increase political will at the national and global level, guide the private sector away from voluntary initiatives and toward legally required changes in practice, give voice to affected communities in setting priority targets and legal standards, and identify and prioritize the communities most in need of assistance to mitigate and cope with the effects of climate change. 'An integrated human, gender and environmental security approach is needed for dealing with the growing threat of climate change, in order to develop appropriate adaptation and mitigation strategies.'[16]

The summit adopted these following conclusions of on climate change:

> Government officials reported the need for tools – both data and stories – to persuade people to help create change. … The group also recommended that women leaders from the Summit be contacted and asked to write to other leaders …, connecting issues of the environment to gender and human security.

The Summit concluded that "the road to real security requires women leaders to integrate state, global and human security in a mutually reinforcing way that builds upon currently existing theoretical frameworks of security policy." Women leaders must also "use existing mechanisms to enforce global standards and existing international law, and create new methods where needed." It argued that "women leaders bring a new perspective to the security policy dialogue … that can make a difference in both government and civil society. Building an inclusive process, persistence, consensus-building, considerations of short- and long-term implications and

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[14] See for details the WBGU website at: <http://www.wbgu.de/wbgu_jg2007_engl.html>, where several expert studies are also available for download in English and German. A summary for policy-makers is at: < http://www.wbgu.de/wbgu_jg2007_kurz_engl.html> and the full report can be downloaded at: < http://www. wbgu.de/wbgu_jg2007_engl.pdf>.

[15] See for details at: < http://womenandglobalsecurity.org/>. A summary report of this event is at: < http://womenandglobalsecurity.org/docs/IWLGSS%20Report.pdf>; and a summary of the background paper on climate change is at: <>

[16] Úrsula Oswald Spring: "Climate Change: A Gender Perspective on Human and State Security Approaches to Global Security"; a summary is at: <http://womenandglobalsecurity.org/index.php?option=com_content& task =view&id=22&Itemid=33>; the full text is at: <http://www.afes-press.de/pdf/Oswald_Climate_Change_gender_perspective_abs.pdf > and her powerpoint presentation to the International Women Leaders Global Security Summit is at: < http://www.afes-press.de/pdf/Oswald_Climate_Change_gender_perspective.pdf >.

a talent for negotiation are some of the cornerstones of traditional women's leadership." Women leaders can "create practical change and apply a human face to security."

The links between climate change, peace and war were analyzed in a report by International Alert, an independent peace building organization; on: *A Climate of Conflict: The Links Between Climate Change, Peace and War* (Smith/Vivekananda 2007), that traces the "conesquences of consequences", i.e. the effects climate change has interacting with socio-economic and political problems in poorer countries. It highlighted four key elements of risk - political instability, economic weakness, food insecurity and large-scale migration and it makes twelve recommendations for addressing climate change in fragile states. It discusses the climate change impacts for Algeria, Darfur, Peru, Bangladesh, and Karachi, governance matters for Mail and Chad, as well as linking for Liberia peacebuilding and climate adaptation and developing social resilience for Nepal. The report supplies two lists of states at risk: a) facing a high risk of armed conflict as a knock-on consequence of climate change (46 states); and b) states facing a high risk of political instability as a knock-on consequence of climate change (56 states). An extended version of *A Climate of Conflict* was published by SIDA (Smith/Vivekananda 2008) that offers case studies on Kenya, Bangladesh, Mali and Chad as well as Sudan and Darfur, Liberia, Nepal, Colombia and Rwanda.

In a study for the *Swedish Defence Research Agency* (FOI), Peter Haldén (December 2007: 4) analyzed 'The Geopolitics of Climate Change' by focusing on: "whether and in what way climate change may alter the conditions of international security." He argues that "organized violence is more likely in regions with weak states and conflictual inter-state dynamics than in those characterized by co-operative relations," and he concludes that "in the short- to medium term, climate change is unlikely to alter the constitutive structures of international security", but that "along-term development marked by unmitigated climate change could very well have serious consequences for international security."

With regard to the impacts of climate change on the Middle East, Ecopeace/Friends of the Earth Middle East tabled a report on '*Climate Change: A New Threat to Middle East Security'* to the COP in Bali in December 2007 (Freimuth/Bromberg/Mehyar/Alkahteeb 2007) in which the authors from Israel, Palestine and Jordan argued that "the climate crisis and its potential physical and socioeconomic impacts are likely to exacerbate this cross-border instability" and that "climate change is likely to act as a 'threat multiplier' – exacerbating water scarcity and tensions over water within and between nations linked by hydrological resources; geography; and shared political boundaries." However, this crisis offers opportunities "for local, cross-border and international cooperation to ameliorate the problems that are already occurring and that are projected to intensify."

Sir Crispin Tickell (2003), the former UK Permanent Representative to the UN, highlighted the environmental factors behind societal collapse. Professor John Mitchell, the chief scientist at the UK Met Office, forecasted that the coming decades will see a 30 per cent increase in severe drought and that Africa will experience increased desertification, water stress, and disease. On 9 January 2004, David King, the UK Government's chief scientific adviser, was quoted as saying that climate change is a far greater threat to the world than international terrorism.[17] In February 2004, John Reid MP, then British Secretary of State for Defence and later Home Secretary, argued that climate change may spark conflict between nations. He forecasted that violence and political conflict would become more likely in the next 20 to 30 years with climate change, he listed among the major threats in future decades, including terrorism, demographic changes, and global energy demand.

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[17] See: Goklany and King: "Climate Change and Malaria", in: *Science*, 1 October 2004: 55-57; BBC (2007) "Global Warming 'Biggest Threat'"; at: <http://news.bbc.co.uk/1/hi/sci/tech/3381425.stm >; see also BBC: "Scientist urges US climate help" on 10 March 2004; at: < http://news.bbc.co.uk/1/hi/sci/tech/ 3498830.stm> and on 31 March 2004; at: < http://news.bbc.co.uk/1/hi/uk_politics/3584679.stm >.

As we look beyond the next decade, we see uncertainty growing; uncertainty about the geopolitical and human consequences of climate change. …Impacts such as flooding, melting permafrost and desertification could lead to loss of agricultural land, poisoning of water supplies and destruction of economic infrastructure. …More than 300 million people in Africa currently lack access to safe water; climate change will worsen this dire situation.[18]

In a speech in Berlin in late 2006, the British foreign secretary Margaret Beckett considered climate change as a "serious threat to international security" that "must not be dealt with using guns and tanks, but through dialogue and the sharing of new technologies between developed and developing countries."

> She warned that when people were faced with the stresses of overpopulation, including a lack of key resources such as water, energy and food, "so we see the slide down the spectrum from stability to instability." A global temperature increase of just two or three per cent would cut the crop yields in Africa, the Middle East and south Asia by up to 40 per cent, causing millions of people to be denied food even more than they are now. Climate change also affected issues such as immigration. A 50 cm rise in sea levels would displace two million people in Egypt and a rise of one metre would displace 25 million in Bangladesh." In short, a failing climate means more failed states. And that has implications for everything we want to achieve from conflict prevention and resolution to counter-terrorism," Ms Beckett said. "By tackling climate change we can help address the underlying securities that feed and exacerbate conflicts and instability. By ignoring it we resign ourselves to the same crises flaring up again and again. And new ones emerging." She said the world was on the verge of "global irresponsibility of a massive and irreversible scale" by refusing to tackle climate change, but warned: "The greatest security threat we face as a global community won't be met by guns and tanks." It will be solved by investment in the emerging techniques of soft power – building avenues of trust and opportunity that will lead to a low-carbon economy. There is no backstop – politics and diplomacy have to work.[19]

John Ashton, a Special Representative for Climate Change of UK Foreign Secretary Beckett, said on 24 January 2007: "There is every reason to believe that as the 21st century unfolds, the security story will be bound together with climate change."[20] He concluded: "Climate change is a security issue because if we don't deal with it, people will die and states will fail." In his view defence and security planners must face a paradox when assessing their responses to the problem. Most security threats in today's world are amenable to some extent to a "hard power" or conventional reaction, he said, and demand will rise for such responses to climate change-related security problems. "But there is no hard power solution to climate change – you cannot force your neighbour to change its carbon emissions at the barrel of a gun."[21]

On 17 April 2007 the UN Security Council for the first time addressed climate change as a security issue. The British initiative during its Security Council Security Council presidency to put climate change on its agenda for 17 April 2007 has been a recent attempt to 'securitize' climate change.[22] In her opening statement, UK Foreign Secretary Margaret Beckett stressed that "what makes wars start – fights over water, changing patterns of rainfall, fights over food

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[18] See: Ben Russell and Nigel Morris: "Armed forces are put on standby to tackle threat of wars over water", in; *Independent*, 28 February 2006; at: <http://news.independent.co.uk/environment/article348196.ece >.

[19] See: British Embassy Berlin: "Speech given by Foreign Secretary, Margaret Beckett, at the British Embassy, Berlin, 24 October 2006"; at: <http://www.britischebotschaft.de/en/news/items/061024.htm>; the quotes are from "Climate change 'serious threat to global security'"; at: <http://www.politics.co.uk/news/foreign-policy/ international-development/debt-and-debt-relief-in-developing-world/climate-change-serious-threat-global-security-$455615.htm >.

[20] Quoted in: Ben Vogel (2007) "Climate change creates security challenge 'more complex than Cold War', in: *Janes.com*; at: <http://www.janes.com/security/international_security/news/misc/janes070130_1_n.shtml>.

[21] Quoted by Chris Littlecott (2007) "Climate Change: The Global Security Impact" 5 February; at: < http:// www.e3g.org/index.php/programmes/climate-articles/climate-change-the-global-security-impact />.

[22] "Press Conference by Security Council President, 4 April 2007"; at: <http://www.un.org/News/briefings/ docs //2007/070404_Parry.doc.htm>;

production, land use. There are few greater potential threats."[23] She argued that "an unstable climate will exacerbate some of the core drivers of conflict, such as migratory pressures and competition for resources." Japan's Ambassador Kenzo Oshima said that "it is clear that climate change can pose threats to national security … [and] in the foreseeable future climate change may well create conditions or induce circumstances that could precipitate or aggravate international conflicts."

However, the representatives of China, Russia, Qatar, Indonesia, and South Africa argued that "the Security Council was not the place to take concrete action." While Pakistan opposed the debate, Peru, Panama, Papua New Guinea, and small island states agreed with the UK. For UN Secretary General, Ban Ki-moon "projected changes in the earth's climate are thus not only an environmental concern. … Issues of energy and climate change can have implications for peace and security." [24]

The climate change issue has been discussed at the G-8 meetings in August 2005 in Gleneagles[25] in the UK and in June 2007 in Heiligendamm in Germany where the heads of states and/or governments of the G 8 agreed … "in setting a global goal for emissions reductions" that they will "consider seriously the decisions made by the European Union, Canada and Japan which include at least a halving of global emission by 2050"[26]. In a joint statement of the German G 8 presidency with the heads of states and/or governments of Brazil, China, India, Mexico and South Africa, the goal of fighting climate change was endorsed, including the "crucial role of economic incentives", investments in "climate friendly investments in large scale", and improved means of adaptation for developing countries "with enhanced technology cooperation and financing".

On 31 July to 2 August 2007, the UN General Assembly held an "informal thematic debate" on "climate change as a global challenge". On 31 July, two expert panel discussions were held that focused on "The science, the impact and the adaptation imperative," and on mitigation strategies in the context of sustainable development. From 1-2 August, member states spoke on their national strategies and international commitments to address climate change.[27]

On 24 September 2007, United Nations Secretary-General Ban Ki-moon convened a high-level event on climate change took "to advance the global agenda on climate change when he me[t] with heads of state and other top officials from more than 150 countries at United Nations Headquarters." This high-level event on the eve of the UN General Assembly's annual General Debate was to secure political commitment and build momentum for the UN-FCCC COP13/MOP3 meeting in Bali on 3-14 December 2007. In his background note, the

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[23] Bloomberg news: "UN attacks climate change as threat to peace", in: *International Herald Tribune,* 18 April 2007: 2;

[24] UN Security Council, SC/9000, 5663rd meeting, 17 April 2007: "Security Council holds first-ever debate on impact of Climate change on peace, security, hearing 50 speakers"; at: <http://un.org/news/press/ docs/2007/ sc9000.doc.htm>; Reuters: "UN Council Hits Impasse over Debate on Warming", in: *New York Times,* 18 April 2007; Edith M. Lederer: "Security Council Tackles Climate Change", in: *Washington Post,* 18 April 2007.

[25] At the G8 meeting in Gleneagles the *Gleneagles Plan of Action* on "Climate Change, Clean Energy and Sustainable Development"; at: <http://www.fco.gov.uk/Files/kfile/PostG8_Gleneagles_CCChangePlanofAction. pdf >:

[26] For the documents of the G 8 Meeting in Heiligendamm, Germany on 8 June 2007; at: < http://www.g-8.de/ Webs/G8/ EN/G8Summit/SummitDocuments/summit-documents.html > and the chair's conclusions; at: < http://www.g-8.de/nsc_true/Content/EN/Artikel/__g8-summit/anlagen/chairs-summary,templateId=raw,property=publicationFile.pdf/chairs-summary>.

[27] Chris Spence; Pamela Chasek: "Summary of the Informal Thematic Debate of the UN General Assembly on Climate Change as a Global Challenge, UN Headquarters, New York, 31 July - 2 August 2007, in: Earth Negotiations Bulletin (New York: IISD, 7 August 2007).

Secretary-General addressed the multiple links of climate change to food, water and health security.[28]

In November 2007, the *Human Development Report 2007/2008. Fighting climate change: Human solidarity in a divided world* (UNDP 2007/2008) warned that the world should focus on the development impact of climate change that could bring unprecedented reversals in poverty reduction, nutrition, health and education. The report offers

> a stark account of the threat posed by global warming. It argues that the world is drifting towards a 'tipping point' that could lock the world's poorest countries and their poorest citizens in a downward spiral, leaving hundreds of millions facing malnutrition, water scarcity, ecological threats, and a loss of livelihoods. "Ultimately, climate change is a threat to humanity as a whole. But it is the poor, a constituency with no responsibility for the ecological debt we are running up, who face the immediate and most severe human costs," commented UNDP Administrator Kendal Derive.

The *Human Development Report 2007/2008* argues, climate change poses challenges at many levels: for all people to reflect on how we manage the environment and on social justice and human rights across countries and generations, for political leaders and people in rich nations to acknowledge their historic responsibility and to initiate significant cuts in greenhouse gas emissions, and for the entire human community to undertake prompt and strong collective action based on shared values and a shared vision. Climate change also poses major obstacles to progress in meeting the Mugs and maintaining progress raising the HDI: "There is a clear and present danger that climate change will roll back human development for a large section of humanity, undermining international cooperation aimed at achieving the Millennium Development Goals (Mugs) in the process."[29]

At the 13th conference of parties to the UNFCCC in Bali on 10 December 2007, the security links of climate change were addressed in a side event by the WBGU, where combating climate change was described as a central peace policy of the 21st century. Without counter measures it may aggravate old and trigger new tensions in parts of the world that may spill over into violence, conflict and war. Areas at increased risk of insecurity include northern and southern Africa alongside countries in the Sahel region and the Mediterranean. Other potential hot spots are central Asia; India, Pakistan and Bangladesh; China; parts of the Caribbean and the Gulf of Mexico and Andean and Amazonian regions of Latin America.

Hans-Joachim Schellnhuber, director of the *Potsdam Institute for Climate Impact Research* (RIK), argued that without resolute counteraction, climate change will overstretch many societies and adaptive capacities within coming decades. This could result in a destabilization and violence jeopardizing national and international security to a new degree. Achim Steiner, UN Under-Secretary General and Executive Director of UN Environment Programme (UNEP), stressed that "there are multiple environmental challenges facing the world and the security of communities and countries. Climate change is perhaps the most high profile. However, if we can counter climate change and climate proof economies to buffer them against the climatic changes already underway, perhaps the world can unite around these other pressing challenges from reversing the decline of biodiversity and loss of marine resources up to designing a more intelligent, fairer and ultimately sustainable global trade regime."[30]

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[28] See: "Background note by the Secretary-General," at: <http://www.un.org/climatechange/2007highlevel/background.shtml >.

[29] UNDP, 2007: *Human Development Reports*; at: <http://hdr.undp.org/>; see also: UNDP/UNEP/World Bank/ADB/AfDB/GTZ/DFID/OECD/EC (2003).

[30] UNEP News Centre: "Climate Change and Conflict – New Report Weighs the Risks and Pinpoints Likely Hotspots"; at: < http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=523&ArticleID=5720&l=en>.

Thus, the year 2007 has been the turning point in the securitization of problems of global environmental change and especially of climate change. During 2007, the IPCC, as a knowledge-based epistemic community, has become a major securitizing actor.

On 3 March 2008, the Council of the European Union released a joint paper on "Climate change and international security". The European Union has taken up the conceptual and political debate on the securitization of climate change and may itself become a major securitizing actor in translating the messages of this book into policies and action.[31] The impacts of climate change as the 'new' security threat for Africa were discussed by Brown, Hammill and McLeman (2007_IA_83_6: 1141-1154), while Barnett (2007) reviewed the linkages between Climate Change and Security in Asia and their implications for Australia.

6.2 Climate Change as a National Security Danger and Concern

In spring 2004 a report by Randall and Schwartz (2004; Brauch 2004a) for the US Department of Defense on the impact of *Abrupt Climate Change on US National Security* was leaked to the press. Three years later, Gilman, Randall, and Schwartz (2007) discussed the *Impacts of Climate Change on US national security* as did a report on *National Security and the Threat of Climate Change* by the US *Center of Naval Analysis* (CNA 2007) on 16 April 2007.

This study addressed three questions: a) on the conditions climate change is likely to produce globally that represent security risks for the US; b) how may they affect the US national security interests; and c) what actions should the US launch to address its national security consequences. The study concluded that the predicted consequences of climate change include: "extreme weather events, drought, flooding, sea level rise, retreating glaciers, habitat shifts, and the increased spread of life-threatening diseases," that may add "new hostile and stressing factors" and that have the potential "to create sustained natural and humanitarian disasters" whose consequences "will likely foster political instability where societal demands exceed the capacity of governments to cope" and it "will add to the tensions even in stable regions of the world".[32] The CNA's Military Advisory Board drew five policy recommendations from its analysis:

1. The national security consequences of climate change should be fully integrated into national security and national defense strategies.

2. The US should commit to a stronger national and international role to help stabilize climate change at levels that will avoid significant disruption to global security and stability.

3. The US should commit to global partnerships that help less developed nations build the capacity and resiliency to better manage climate impacts.

4. The Department of Defense should enhance its operational capability by accelerating the adoption of improved business processes and innovative technologies that result in improved US combat power through energy efficiency.

5. The Department of Defense should conduct an assessment of the impact on US military installations worldwide of rising sea levels, extreme weather events and other projected climate change impacts over the next 30 to 40 years.

On 29-31 March2007, the Strategic Studies Institute and the Triangle Institute for Security Studies conducted a colloquium on "Global Climate Change: National Security Implications,"[33] that reached the following key insights:

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[31] Andrew Bounds: "Climate change poses 'security risk'", in: *FT.Com*. 3 March 2008; Ian Traynor: "EU told to prepare for flood of climate change migrants", in: *The Guardian*, 10 March 2008:

[32] This report was discussed at a meeting on "National Security and the Threat of Climate Change", by the Environmental Change and Security Program (ECSP) of the Wilson Centre on 14 May 2007.

[33] Other co-organizers included the Army Environmental Policy Institute, The Center for Global Change (Duke University), Creative Associates, The Nicholas Institute for Environmental Policy Solutions (Duke Univer-

- Climate change is underway. The effects will vary according to a broad variety of circumstances and interactions, some of which are not well-understood. Likewise, mitigation is not well understood, and will not take place quickly.

- The national security implications of climate change are proportional both to the speed of change and the extent. Public awareness should follow a coordinated strategic communication plan that focuses on maintaining credibility.

- Threats to national survival stemming from catastrophic change must be anticipated, evaluated, and neutralized to the greatest degree possible.

- The entire range of plausible threats needs to be delineated, then analyzed and early warning criteria established. The alternative approaches and cost-benefit analyses must be run to establish what can be done, when, and at what cost.

- While military forces have roles in disaster relief, the broader impact of serious climate change will require multinational, multi-agency cooperation on a scale heretofore unimaginable and could provide no-fault ground for global cooperation.

- Effective interagency action may require new legislation and better definition of Department of Homeland Security authority.

- Should global cooperative measures fail, the first impact will likely come from large numbers of displaced people who, by the very nature of their displacement, will become subject to malnutrition and disease; agricultural dislocation could aggravate or spark displacement and border security issues could arise as well.[34]

In November 2007, the *Center for Strategic and International Studies* (CSIS) and the *Centre for a New American Security* (CNAS) released a report on: *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change* (Campbell/Lennon/Smith 2007) that was co-authored by a group of high-level US security experts and climate specialists that discussed three future worlds with climate change impacts during the next 30 and 100 years.

> The three scenarios we develop in this study are based on *expected, severe,* and *catastrophic* climate cases. The first scenario projects the effects in the next 30 years with the *expected* level of climate change. The *severe* scenario, which posits that the climate responds much more strongly to continued carbon loading over the next few decades than predicted by current scientific models, foresees profound and potentially destabilizing global effects over the course of the next generation or more. Finally, the *catastrophic* scenario is characterized by a devastating 'tipping point' in the climate system, perhaps 50 or 100 years hence. In this future world, global climate conditions have changed radically, including the rapid loss of the land-based polar ice sheets, an associated dramatic rise in global sea levels, and the destruction beyond repair of the existing natural order.

The authors drew several policy conclusions from the discussion of these three scenarios:

- Historical comparisons from previous civilizations and national experiences of such natural phenomena as floods, earthquakes, and disease may be of help in understanding how societies will deal with unchecked climate change.

- Poor and underdeveloped areas are likely to have fewer resources and less stamina to deal with climate change – in even its very modest – and early manifestations.

- Perhaps the most worrisome problems associated with rising temperatures and sea levels are from large-scale migrations of people – both inside nations and across existing national borders.

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sity), The Environmental Change and Security Program (The Woodrow Wilson International Center for Scholars), and the Department of Environmental Sciences at the University of North Carolina-Chapel Hill.

[34] U.S. Army War College and Triangle Institute for Security Studies, Strategic Studies Institute, Colloquium Brief, compiled by Douglas V. Johnson II; at: <http://www.strategicstudiesinstitute.army.mil/pdffiles/PUB779.pdf>.

- The term 'global climate change' is misleading in that many of the effects will vary dramatically from region to region. A few countries may benefit from climate change in the short term, but there will be no 'winners'.

- Climate change effects will aggravate existing international crises and problems.

- We lack rigorously tested data or reliable modelling to determine with any sense of certainty the ultimate path and pace of temperature increase or sea level rise associated with climate change in the decades ahead.

- Any future international agreement to limit carbon emissions will have considerable geopolitical as well as economic consequences.

- The scale of the potential consequences associated with climate change – particularly in more dire and distant scenarios – made it difficult to grasp the extent and magnitude of the possible changes ahead.

- At a definitional level, a narrow interpretation of the term 'national security' may be woefully inadequate to convey the ways in which state authorities might break down in a worst case climate change scenario.

Also in November 2007, the *Council on Foreign Relations* (CFR) released a report on: *Climate Change and National Security* in which Joshua W. Busby that made recommendations for action. He proposed several feasible and affordable policy options to reduce the vulnerability of the United States and other countries to the predictable effects of climate change. He argued that sharp GHG reductions in the long run are essential to avoid unmanageable security problems. The participation in reducing emissions can help integrate China and India into the global rules–based order, as well as help stabilize important countries such as Indonesia. He suggested bureaucratic reforms that would increase the likelihood that the U.S. government will formulate effective domestic and foreign policies.

These studies were picked up by members of the U.S. Congress. In March 2007, Senators Richard J. Durbin (D-IL) and Chuck Hagel (R-NE) submitted a bill requesting a National Intelligence Estimate to assess whether and how climate change might pose a national security threat. Also for the U.S. the year 2007 has been the turning point when climate change was finally perceived as a security danger and concern for U.S. national security policy. To which extent this emerging new policy debate on environmental and climate security issues will lead to policies to counter these security threats, challenges, vulnerabilities and risks will depend on the outcome of the U.S. presidential elections of 2008 but also on the post-Kyoto 2012 climate regime.

Besides, in Europe and the U.S., since 2006 and 2007 climate change has also become an urgent security issue in Australia. In *heating up the planet* Alan Dupont and Graeme Pearman (2006) analyzed the linkages between climate change and security arguing that climate change will complicate Australia's security environment in several ways:

- First, weather extremes and greater fluctuations in rainfall and temperatures have the capacity to refashion the region's productive landscape and exacerbate food, water and energy scarcities in a relatively short time span. Sea-level rise is of particular concern because of the density of coastal populations and the potential for the large-scale displacement of people in Asia.

- Secondly, climate change will contribute to destabilizing, unregulated population movements in Asia and the Pacific. Most of these flows are likely to be internal, but the ripple effects will be felt beyond the borders of the states most affected, requiring cooperative regional solutions.

- Thirdly, more extreme weather patterns will result in greater death and destruction from natural disasters, adding to the burden on poorer countries and stretching the resources and coping ability of even the most developed nations.

- Fourthly, extreme weather events and climate-related disasters will not only trigger short-term disease spikes but also have more enduring health security consequences, since some infectious diseases will become more widespread as the planet heats

- Fifthly, even if not catastrophic in themselves, the cumulative impact of rising temperatures, sea levels and more mega droughts on agriculture, fresh water and energy could threaten the security of states in Australia's neighbourhood by reducing their carrying capacity below a minimum threshold, thereby undermining the legitimacy and response capabilities of their governments and jeopardising the security of their citizens. Where climate change coincides with other transnational challenges to security, such as terrorism or pandemic diseases, or adds to pre-existing ethnic and social tensions, then the impact will be magnified. However, state collapse and destabilizing internal conflicts is a more likely outcome than interstate war. For a handful of small, low-lying Pacific nations, climate change is the ultimate security threat, since rising sea-levels will eventually make their countries uninhabitable.

Dupont and Pearman argued that climate change poses fundamental questions of "human security, survival and the stability of nation-states" that must dictate fresh judgments about political and strategic risk as well as economic cost. In October 2007, an opinion survey conducted by the U.S. Studies Center at the University of Sydney in July 2007 "showed that 40 per cent of Australians thought that global warming was a greater threat to security than Islamic fundamentalism. Only 20 percent thought it was less serious." According to Alan Dupont, the director of this institute, "climate change has moved from the environmental field to the security sphere." The Australian Police Commissioner Mick Keelty, argued that climate was a growing security concern. "We could see a catastrophic decline in the availability of fresh water. … Crops could fail, disease could be rampant and flooding might be so frequent that people, en masse, would be on the move. Even if only some and not all of this occurs, climate change is going to be the security issue of the 21st century."

Thus, by end of 2007, climate change was not only addressed by several scientists, governments and international organizations as a new and urgent security danger, it was also perceived in many countries as a major new international, national and human security concern.

6.3 Climate Change as a Human Security Danger and Concern

Climate change also poses severe security impacts for human security and its referent objects: human beings and humankind. From a human security perspective, climate change has been addressed by the GECHS programme of IHDP in June 2005[35] and it is the focus of the Greek Presidency of the Human Security Network (2007-2008).[36]

A 'Policy Memorandum' on '*Climate Change and Human Security*'[37] released on the eve of the first debate of the UN Security Council on climate change on 17 April 2007, pointed to manifold impacts for international, national, and human security for selected direct, indirect, and slow-onset linkages. Some effects are already evident and will become very clear in the short run (2007-2020). They will increase and others will manifest themselves in the medium term (2021-2050); whilst in the long run (2051-2100), they will all be active and interacting strongly with other major trends. Africa is very likely to suffer very damaging impacts and has the least resources for coping and adapting to these stresses.

New studies confirm that Africa is one of the most vulnerable continents to climate variability and change because of multiple stresses and low adaptive capacity. Some adaptation to current climate

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[35] On 21-23 June 2005, *The Global Environmental Change and Human Security* (GECHS) project of IHDP organized a workshop in Oslo on 'climate change and human security'; at. < http://www.cicero.uio.no/humsec/>; papers at: http://www.cicero.uio.no/humsec/list_participants.html; Six papers have been published in a special issue on "Climate Change and Human Security", of: *Erde,* 137, 3: 155-270.

[36] See the Greek concept paper on: "Human Security and the Climate Change Impact on Vulnerable Groups" of 8 May 2007; at: < http://www.humansecuritynetwork.org/docs/2007-ministerial-meeting-04-greek%20paper. doc>.

[37] See the memorandum written by: Wisner, Fordham, Kelman. Rose Johnston, Simon, Lavell, Brauch, Oswald Spring, Wilches-Chaux, Moench and Weiner (2007).

variability is taking place, however, this may be insufficient for future changes in climate (IPCC 2007: 10).

Livelihood security and other aspects of human security interact with 'hard' security issues because of the national and regional upheavals that climate stress may put on livelihood systems already vulnerable and incapable of adapting.[38] The rural and urban poor are already under stress, and for some groups such as women-headed households in Africa, adaptation to climate-induced stress will be very difficult indeed. Some major climate changes may actually occur rapidly.

Figure 1.1: Matrix of Possible Climate Change and Security Interactions over Time. **Source**: Policy Memorandum: *Climate Change and Human Security*, 15 April 2007. Written permission by group's coordinator Ben Wisner was received.

	Direct impact	Indirect Consequences					Slow-onset
	Water	Food	Health	Mega-projects	Disasters	Biofuel	Sea level
Short term (2007-2020)	Local conflict over water	Failure to meet MDGs	Failure to meet MDGs	Long history of development-induced displacement from 1950's	Nation states begin to lose credibility due to inability to prevent large disasters	Isolated food – fuel competition and price spikes	Small number of displacements
Medium term (2021-2050)	Increased local & some international conflict over water	Significant displacement due to famine	Interacts with food production problems	Displacement of rural poor due to CDM & large scale dams & other state based mitigation & adaptation projects	Significant political unrest due to failure of DRR & inadequate recovery in many countries	Food-fuel competition increases & biodiversity erosion	Increasing displacement & national/ international tension
Long term (2051-2100)	Major international conflict over water	Major displacement & political upheaval	Major displacement due to epidemics	Major urban upheaval and other political fall out from mega-project displacement	Major upheaval with international implications due to unattended weather catastrophes	Major discontent due to food-fuel competition	Major international tensions due to population displacement
	All of these processes strongly interact with each other						

On the political level, besides the *Human Security Network* (HSN), the *Friends of Human Security* (FHS) that are coordinated by Japan and Mexico, at their third meeting on 7 November 2007 at the UN Headquarters in New York discussed issues related to climate change and human security that were addressed in the joint symposium by the permanent missions of Japan and Mexico and OCHA on 31 July 2007 that focused on the impact of climate change in

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[38] On the definition of "vulnerability" at the scale of household livelihoods and its linkage with macro-scale processes, see Wisner/Blaikie/Cannon/Davis (2004).

developing countries, the challenges of disaster risk reduction and the interlinkages between development and security.[39]

In his concluding remark of the third meeting of the FHS, the Mexican co-chair noted that it was important that human security should be understood as a multidimensional concept, which would also contribute to breaking the existing polarization of the three pillars of the UN: peace and security, development, and human rights.

The conceptual debate on the linkages between climate change and human security is just starting. Barnet and Adger (2005: 1) discussed as the ways in which climate change may undermine human security and how human insecurity may increase the risk of violent conflict as well as the role of the states in human security and peace building. Schnabel (2007) addressed the linkages between climate change, human (in-)security and stability because anthropogenic "climate change will cause great human suffering and poses a risk to economic development and social and political stability" but will also act as a "powerful amplifier of existing threats."

7 The Emerging Securitization of the Grounds of the Securitization of Soil Erosion and Desertification

While the linkage between problems of soil erosion and degradation and desertification with food security has been addressed since the 1990's, the systematic securitization of problems of soil erosion and desertification started with a NATO sponsored conference on desertification as a security issue in the Mediterranean in December 2003 in Valencia (Kepner/Rubio/Mouat/Pedrazzini 2006).[40] Subsequent meetings in Almería (2006) discussed the links between desertification and migration that have become a major national and regional security issue among the states of North and West Africa and Southern Europe.[41] These links have also been addressed by UNCCD during the CRIC 3 meeting in Bonn in May 2005.[42]

During the German EU presidency the *Federal Ministry for Economic Cooperation and Development* (BMZ) and the *Federal Foreign Ministry* (AA) in cooperation with the UNCCD Secretariat organized a workshop on "Desertification: A security threat? – Analysis of risks and challenges", on 26 June 2007 that tried "to facilitate debate about the linkages between security and the degradation of land resources." The goal of the foreign ministry was to extend the concept of cooperative security where confidence-building plays a key role. The state secretary of the German foreign ministry, Georg Boomgaarden, referred to an extended security concept that offers answers to the question

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[39] See: Workshop on "Climate Change from the Perspective of Human Security"; at: < http://ochaonline.un.org/ WhatsNew/ClimateChangeandHumanSecurity/tabid/2106/Default.aspx>; see the presentation by Under-Secretary-General John Holmes' on: "Human security and disaster reduction". In the view of John Holmes, Under-Secretary-General for Humanitarian Affairs and Emergency Relief Coordinator, "It has become obvious that climate change is the biggest threat the planet faces, especially to the poorest and the most vulnerable among us. Climate change, and the natural hazards and extreme weather events that are associated with it, are not some distant, future threat. The threat to human security is here, it's real, and it's today." <

[40] At the Valencia conference Brauch (2003, 2006) provided a systematic overview of the manifold conceptual linkages between processes of desertification and their impacts in terms of water, food and health security that may have repercussions for national and regional security. Other contributions by Kepner (2006), Rubio/Recatala (2006); Yousef/Hegazi (2006); Safriel (2006) discussed security aspects from the perspective of the natural sciences, while Lopez-Bermudez/Garcia-Gomez (2006) referred to the links with food security.

[41] See for the conference documents at: <http://www.sidym2006.org/eng/eng_ponencias_conclusiones.asp>.

[42] See for a brief report at: <http://www.afes-press.de/pdf/UNCCD_journal_050511.pdf> and a documentation of the CRIC-meeting at: <http://www.afes-press.de/pdf/Earth_negot_bulletin_04_175.pdf>; see also the opening speech by Brauch; at: <http://www.afes-press.de/pdf/Brauch_Almeria_Valencia.pdf> and the major speech by Oswald/Brauch; at: <http://www.afes-press.de/pdf/Oswald_Brauch_lang.pdf>.

whether crises could be coped with politically, culturally and socio-economically before military means were required. Civil crisis prevention and early warning systems were set to attain even more significance in the future. The phenomenon of failing states must not be allowed to spread further on account of deteriorating environmental conditions. … 'If we ask ourselves who the enemy is in climate change, using the concepts of classic security policy, we must conclude that we are turning nature itself into an enemy', the State Secretary said. #And with this enemy, neither deception nor deterrence is going to be of any use. The later we adapt, the greater the cost will be.' … Avoiding security-relevant cataclysms of global extent required the course to be set today. The time window for possibly irreversible processes to occur as a result of global temperatures rising by more than two degrees compared to pre-industrial days was about to close.

Pekka Haavisto, the former EU Special Representative for Darfur, referred to the manifold linkages of desertification to global, regional, national and human security:

> Desertification and security has many aspects, and indeed there are many securities. … When we speak about climate change and desertification, we are referring to global security instead of only looking at security from a regional or national point of view. Climate change and desertification have local and regional security aspects as well as international ones. Then there is the issue of human security, affecting individual people and their human rights. First of all, people must have security in those places that they have traditionally been living in. If they have to go elsewhere for reasons of security, we have to provide security to those people under new circumstances. Human security is linked to the risks of migration. Refugees and IDPs are more and more on the agenda of the international community.

Michelle Leighton, University of San Francisco, also referred to the dual security aspects with regard to migration triggered by desertification that "International migration can raise security issues in countries of origin, transit and destination, both in terms of human security and national security."

From the perspective of NATO, Fausto Pedrazzini argued "that issues like environmental security, food security, and desertification are very much related to the overall concept of security because they affect human and societal dynamics, they may lead to migration, and they have a strong influence on political stability and possible conflicts at all levels." During the *International Year to Combat Desertification* (2006) several presentations at national events touched the security linkage.[43] But contrary to the intensive securitization of climate change no similar policy debate has so far emerged with regard to desertification.

8   A Research Manifesto: Linking Anthropocene, HUGE and HESP: Fourth Phase of Environmental Security Research

After two decades of research "environmental security discussions can now move to a fourth stages of synthesis and reconceptualization" (Dalby 2002a: 96). Oswald Spring, Brauch and Dalby (2008) outlined the topics, scope, areas and methods for a fourth research phase on human, environmental and gender security and peace research (Dalby 2002, 2007, 2007a, 2007b, 2008, 2008a; Brauch 2003, 2003a, 2005, 2005a; Oswald 2001, 2006; Boulding 2006). This phase, they argue, needs to build on the first three phases of environmental security research (by Dalby/Brauch/Oswald 2008) while explicitly incorporating advances in earth system science and disaster research into the analysis. It requires distancing security analysis from some of traditional assumptions in international relations thinking and focusing more explicitly on the specific contexts where people, especially socially vulnerable groups and their social networks, are insecure.

While the first three phases of environmental security research primarily focused on the 'nation state' as the key referent of environmental security concepts and policy ('national

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[43] See the presentations of Brauch in Cairo (2006x), in Rome (2006y), in Florence (2007xa) and in Fuerteventura (2007xy) that can be accessed at:

security'), this chapter suggests that during the fourth phase the referent object of securitization should be both *widened* and *deepened* (Buzan/Wæver/de Wilde 1998; Brauch 2003, 2005, 2008, 2008a, 2008b; Oswald 2006). This implies that the environmental dimension of security should include both societal (Wæver 2008a), human and gender (Oswald 2001) issues but also sectoral approaches such as water, food, health, and livelihood security (Bohle 38) and ecofeminist perspectives (Oswald). Furthermore, the widening of the referents (or deepening) of securitization should include – besides the narrow focus on 'national security' – the global, regional, societal, community, family and human level. Thus, the state-focused approach to environmental security should be broadened to a 'people-centred' approach (Annan 2001, 2005; CHS 2003; Bogardi/Brauch 2005).

8.1 Earth System Research and the 'Anthropocene'

One of the weaknesses in the environmental conflict literature in the 1990's was the failure to incorporate environmental science and ecological understandings directly into discussions of ecological change and environmental degradation.[44] Simple environmentalist assumptions of worsening conditions were frequently used as independent variables without enough careful analysis of the specifics of particular environments (Sullivan 2000). Taking the relevant science on environmental change seriously is unavoidable if the fourth phase analyses of insecurity are to link physical and human sciences in a useful way. The contemporary work in earth system science is trying to comprehend the interlinkages and connections in the biosphere (IGBP 2001). Crucially it involves understanding the environment as the shared context for human life that is now being substantially changed by both anthropogenic and natural processes. This links human actions at the largest planetary scale with practical ecological processes in specific places and shows that assumptions of nature separate from humanity are not accurate modes of considering either environment or security (Schellnhuber/Crutzen/Clark/Hunt 2005).

Understanding humanity as part of a dynamic biosphere that is being actively changed by human actions allows for an overarching conception of the human predicament, and one that directly connects the consequences of consumption in one part of the planet with the hazards being faced by people in other parts. Making these connections explicit suggests a new global ethic where responsibilities to people in other parts of the world are related to the ecological interconnections of people in distant places (Pirages/DeGeest 2004). If global climate change is partly caused by excessive consumption in one part of the world, but increases the vulnerabilities elsewhere, then there is an obligation on the part of the consumers to take responsibility for the consequence of their actions at a distance.

In particular 'earth system research' (Schellnhuber/Wenzel 1998; Steffen/Sanderson/Tyson/Jäger/Matson/Moore III/Oldfield/Richardson/Schellnhuber/Turner II/Wasson 2004; Schellnhuber/Crutzen/Clark/Hunt 2005) offers a conceptual framework combining the various syndromes of environmental change. It insists on the importance of understanding the global economy as an ecological factor, one that has introduced novel 'forcing' agents into the biosphere, most notably such things as ozone depleting chemicals and greenhouse gases. The sheer scale of human activity becomes clear when looking at how the various facets of our collective activities act as ecological mechanisms (McNeill 2000, 2008). We can no longer operate with a set of categories that assume environment as an external factor to human affairs; the separation no longer makes sense when scientific knowledge is taken seriously and the scale of contemporary global changes is recognized (Dalby 2006).

Following a suggestion by Paul Crutzen and Eugene Stoermer (2000; Crutzen 2002), the *International Geosphere Biosphere Programme* (IGBP 2001) and other earth scientists suggest

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[44] For surveys of this literature see i.a.: Gleditsch 1997, 1998, 2001, 2001a, 2001b, 2003; Kahl (2003, 2006); Brauch 2003, 2007, 2007a, 2007b, 2007c.

that we now live in a new era of natural history, the *Anthropocene*; one marked by the emergence of a new series of geological, biological and climatological forcing mechanisms in the biosphere. We have left the period of the *Holocene*, the relatively stable period of earth history between the end of the last ice age and the appearance of industrial society. Human activities have introduced new biophysical factors into the biosphere and begun to change the physical parameters that determine the functioning of the major earth system processes. The most high profile of these is climate change but other systems are being fundamentally altered too. The need for a new term comes not from a single historical innovation or ecological change but from the recognition that the total amount of human activity in all its diversity is now on such a scale that we are living in a qualitatively new era. In terms of the sciences of climate, geochemistry, geomorphology and ecology it is no longer appropriate to think only in terms of 'natural' mechanisms to understand the processes that shape our habitat.

Climate change and carbon dioxide levels are only one facet of the changes that matter. The artificial 'fixing' of nitrogen, the rapid increase in human appropriations of 'natural' productivity, the extinction of avian and mammalian species not to mention the depletion of the oceanic fish stocks, all interact in fashions that we don't yet understand (UNDP 2007). What is clear is that many of these relationships work in non-linear often chaotic ways which will produce surprises in the future. Where the critical thresholds are we simply don't know, although we discovered one relating to ozone depletion in the 1980's quite by accident. There may well be negative feedback systems that counteract some of the perturbations, but there is no reason to believe that the cascading inter-connected non-linearities will be benign to the current arrangements of human civilization (Schellnhuber/Crutzen/Clark/Hunt 2005).

During last half century many environmental concerns emerged that require a 'global' response. But in the *Anthropocene* no single environmental concern matters. It's the cumulative totalities that are beginning to interact in all sorts of unpredictable synergies that matters. In that sense the environment as a simple category of concern has also been transcended; the preservationist and romantic premises of its arguments have been undercut by both the scale of human activity and the growing sophistication of scientific understandings of ecology. Technical fixes can solve many pollution problems, but grasping the totality of material transformations is what is now the pressing priority; not least because the changes in climate and ecological processes render poor populations, in places apparently remote for industrial societies, especially vulnerable (Dalby 2003).

Ecology thus has a geopolitical dimension, and this is especially clear at the global scale where human actions are now an increasing ecological change mechanisms. One that has to recognize environments as actively constructed on various scales by their human inhabitants; simplistic assumptions about degradation as a cause of many things confuse science and environmentalism. This new geological era requires a different understanding of the environment and hence, crucially, of the changing social context of humanity. Naming our era the *Anthropocene* signals this epochal shift in human circumstances; it necessitates a rethinking of many other facets of human existence connected directly to the emerging understandings of that changing global ecological context (Flannery 2006). Above all else it emphasizes the simple but crucial point that human activities are interconnected in numerous ways that cannot be ignored if human security is to be taken seriously. Environment is no longer the separate backdrop for human activities. It is increasingly the artificial context in which we all live and as such it is the shared context of our insecurities.

8.2 Human, Gender and Environmental Security (HUGE)

The deplorable conditions of physical, environmental, human, societal and gender security of a large part of humanity have inspired researchers (Oswald 2001, 2006, 2008 88; Møller 2001, 2003: 278-279) to ask security *for whom* (the nation state, society, human beings or humankind or the environment); *for what* (eternal or earthly peace, social justice, humane

livelihood, sustainable development, gender equity); *from whom* (state and sub-state actors, terrorists, migrants, alien cultures, multilateral organizations, globalization, elites, nature, humankind, patriarchy, totalitarian institutions, religions, cultures and intolerance) and *for what* (sovereignty, territorial integrity, national unity and identity, survival and quality of life, sustainability, equity, identity, social representations and solidarity).

Oswald (2001, 2004, 2006) suggested a widened concept of *Human, Gender and Environmental Security* (HUGE)[45] that combines an extended gender concept including children, elders, indigenous and other minorities with a human-centred focus on environmental security challenges, peace-building and gender equity. 'Gender security' is considering livelihood, food security, health care, public security, education and cultural diversity. This broad concept analyses the patriarchal, violent and exclusive structures within the family and society, questioning the existing process of social representation-building and traditional role assignation between genders. HUGE reorients 'human security' to include equity and development issues through social organization, specific governmental policies, private ethical investments and legal reinforcements. It aims at a socio-political participation of women, the young and elders. It focuses on gender discrimination and violence (Johnson 2002), by widening the narrow male-female relationship of some feminist approaches.

HUGE includes 'environmental security' concerns where a healthy environment and resilience-building of highly vulnerable groups (especially women) can reduce risk impacts (Oswald 2008a). For hazard prone areas, HUGE analyses the potential of technical, financial and human support for reducing this vulnerability, enabling women and other exposed groups to reinforce their own resilience through bottom-up organization combined (Oswald 2008) with top-down policies and tools able to guarantee effective early warning, evacuation, disaster help and reconstruction. Immediate and efficient support for isolated regions affected by social and natural disasters could prevent long-term effects such as famine and violent conflicts. As non-violent conflict resolution is a central part of personal and social identity in a world where processes of unification and diversification are occurring faster than ever in the past, human beings have a basic necessity to simplify and to put order into complex realities through social comparison. The upcoming system of values, ideas and practices enhance conditions for living together, offering persons and groups the possibility to get familiarized with the social and material world. In synthesis, HUGE integrates social, environmental, human, cultural, political and identity concerns, aiming at solidarity, resilience, participatory democracy, peace-building and equity in a world that is facing many new security dangers and concerns due to the gradual transition from the Holocene to the Anthropocene.

8.3. Human and Environmental Security and Peace (HESP)

Thus, HUGE offers both an analytic framework for analysis and participatory action. A fourth phase of research on '*human and environmental security and peace* (HESP)' should combine the structural factors from the natural and human dimensions of *global environmental change* (GEC) based on the expertise from the natural and social sciences with outcomes and conflict constellations (Brauch 2003, 2003a, 2005, 2005a).

Both HUGE and HESP are complementary, although there are differences in the goals and focus. HESP aims at these ten conceptual and policy goals:

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[45] The HUGE concept draws a, broadly defined, feminist analysis of society, power and identity. This shows that for several thousand of years the world has been organized through patriarchal relations where the male gender (strong sex) dominates over the female one (weak sex), including a symbolic distribution of public space for men and private for women and where power relations are also gendered: men public affairs; women delegated powers through household).

Scientific Orientation and Approach

1. *Orientation*: An equity-oriented Grotian perspective may support multilateral environmental efforts in international organizations and regimes to avoid conflictual outcomes of global environmental change, environmental scarcity, degradation and stress.
2. *Spatial Approach.* The analysis of environmental security issues on a regional level requires a spatial approach which may be called a *political geo-ecology*.[46]
3. *Human Security Focus*: The reference for research and policy should be human beings, individual victims and communities of distress migration, disasters, crises and conflicts**.**
4. *Sustainable Development and Sustainable Peace*: A human security perspective to the analysis of environmental security issues may aim at an enduring "sustainable peace".

Scientific Focus on Causes, Impacts and Extreme Outcomes of Global Environmental Change

5. *Causes*: The research should broaden the scope to include both environmental degradation and environmental scarcity and their impact on environmental stress and on nature and human-induced hazards. This requires close interaction between social and natural sciences and an interdisciplinary approach.
6. *Outcomes*: The research should include hazards, distress migration and environmental refugees as well as the complex interactions among these outcomes which may often lead to disasters, crises and conflicts.
7. *Policy Process*: Case studies should include the policy processes, e.g. how the state and the society have responded to the challenges and outcomes, they should emphasize the role the knowledge factor (learning, capacity building) has played in developing adaptive and mitigation strategies to reduce vulnerability and to strengthen resilience.
8. *Regional Orientation*: A regional perspective on the causes, the policy process and its outcomes is needed. This requires regional natural science models (climate, soil, water), and comparative social science case studies on the policy processes at the regional scale.

Policy Goals

9. *Policy Goals on the Societal and Individual Level*: Environmental security studies should contribute to strategies for reducing the *impact* of environmental stress, decreasing the *vulnerability* and strengthening the coping capacities and *resilience*.
10. *Policy Goals on the Communal, Sub-national, National and International Level*: Strategies for coping with outcomes of environmental stress should be developed by improving disaster preparedness and response and by integrating disaster reduction into development planning and resilience-building. The resolution, prevention and avoidance of resulting violence should become a major policy goal (Brauch 2005: 37-39).

HESP combines a *normative orientation* at the dual policy goals of *sustainable development* and *sustainable peace* with a 'people-centred' *human security perspective* from the individual to the global level to develop strategies for adaptation and mitigation and to reduce the likelihood and impact of vulnerability to these outcomes by strengthening resilience. However; neither in the scientific community nor in politics, an agreement exists – and will hardly ever exist in the future – on how to operationalize these dual goals as guidelines for analysis and action (Brauch 2008a). Both concepts and policy goals of *sustainable development* and *sustainable peace* are as highly contested as the security concept. Nevertheless, these dual goals require the scientific development of complex knowledge, a societal and political problem awareness, anticipatory learning and 'ingenuity' in the framework of a 'culture of prevention'.

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[46] Geoecology was introduced by Huggett (1995) as an interdisciplinary natural science. A *political geoecology* focuses from the perspective of international relations on the interactions between the geosystem and human activities, and especially on national and international political processes (Brauch 2003: 134, 2003a: 921-922). These three authors intend to develop this new approach of a *political geoecology* further in a third co-authored chapter to be published in vol. V of this book series from their respective scientific background in social anthropology, geography and political science.

From a scientific perspective that adheres to a rather narrow, strictly defined focus and rigorous primarily quantitative research methods, this wide and embracing scientific concept and research goals are likely to be heavily criticised. This wide ranging understanding will be most likely be rejected as impractical within a traditional quantitative scientific under-standing. However, that traditional scientific approach has failed, and will continue to fail, to address the interconnectedness of highly complex human or societal and natural factors precisely because its mode of understanding deals with analysis of discrete entities rather than complex social systems.

Undoubtedly the ten programmatic points for a fourth research phase on 'environmental se-curity' that were submitted first by Brauch (2003, 2003a, 2005, 2008) are intended to provoke scientific objections, suggestions and critiques and in response more conceptual work and policy oriented scientific reflection will be needed. Most certainly, its emancipatory approach is bound to clash with purely scientistic, primarily apolitical and frequently quantitative approaches that often are limited to explain the complex reality with highly sophisticated methods and narrow results that regularly resist any translation as guidelines for policy action and change that aims at an improvement of the prospects for the majority of humankind in their struggle for daily survival for their well-being and for a life in dignity.

The policy relevance of HESP as a research programme for a fourth phase of research is to *recognize* early-warning indicators, to *examine* both the environmental consequences of wars and the existing conflicts over scarce resources that may lead to environmental stress to *prevent* that they escalate into violence and, last but not least, to develop longer-term prio-rities for developed and developing countries, and for international organizations to prevent avoid violent and fatal societal consequences of extreme weather events and hazards from oc-curring, and to contribute to regional environmental good governance.

9   Facing and Coping with Global Environmental Change by Responding with a New Peace Policy for the 21st Century

Both theory-guided, conceptual and empirical scientific research must move from 'facing glo-bal environmental change' to 'coping' with climate change, water scarcity and desertification in a proactive way which requires an 'anticipatory learning' process to which both the natural and social sciences have to contribute to achieve the goal "to save succeeding generations from the scourge of war" that has been addressed in the preamble of the UN Charter and to move towards a 'sustainable peace' (Oswald Spring 2008) with 'sustainable development' (Brundtland 1987) strategies. This is the huge challenge humankind is confronted with in the 21st century.

With the fourth IPCC Assessment Report in 2007, the Intergovernmental Panel on climate Change has become a major new securitizing actor. Already in 2004 David King, the science adviser of former prime minister Tony Blair (UK), warned that climate change is a more severe security threat of the 21st century than terrorism. On 17 April 2007, the UN Security Council for the first time discussed Climate Change as a new security threat confronting humankind where the 'enemy' is 'us' and our consumption of fossil energy and the 'victims' are humankind and especially the most vulnerable people in the global south that have contributed least.

From 1974 to 2003 more than 5 billion people were affected by human-induced natural hazards most of them by climate related events, such as floods, drought, famine, forest fire and heat waves. Thus, climate change is already killing people and the likelihood will increase that climate change will lead to forced migration, domestic crises and even violent conflicts. Neither the military nor any national security strategy can cope with this challenge

unilaterally that often poses a 'survival dilemma' for the most vulnerable poor populations in the global South.

What is needed is a new global multilateral strategy for coping with climate change by adaptation and mitigation measures. Countering anthropogenic climate change has become a major challenge to international peace and security where us is the enemy and not they. Thus, a proactive multilateral climate change policy becomes the task for a new global peace policy in the framework of a progressive post 2012-Climate Policy.