1 Introduction: Climate Change, Human Security, and Violent Conflict in the Anthropocene

Hans Günter Brauch and Jürgen Scheffran

1.1 Context of the Book

1.1.1 Concepts and Objectives

This book focuses on possible causal linkages among the three scientific research areas of climate change, human security, and violent conflict and asks whether they have posed challenges for societal stability in the past and in the present, and whether climate change might intensify societal instability in the future. It addresses scientific problems that are primarily analysed

- in the natural sciences: climate change as an object of climatology, physics, chemistry, oceanography, physical geography, and integrative earth systems analysis or science;
- and in the social sciences: security, conflict, and stability as themes of political science, sociology, human and political geography, economics, history, and international law.

All four scientific concepts are “essentially contested” (Gallie 1955–1956):

- Climate change refers both to the ‘natural variability’ in the climate system, which has fluctuated between warm and cold periods during the Holocene since the end of the glacial periods 12,000 years ago, and to anthropogenic global warming during the ‘Anthropocene’ (Crutzen 2000, 2006, 2011) which has increasingly become an object of scientific analysis since the 1970s.

- Security is a societal value, a political goal, and an instrument aimed at protection, risk reduction, certainty, predictability, reliability, trust, and confidence, in contrast to danger, risk, threat, disorder, and fear. "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” (Wolfers 1962: 150), and in an intersubjective sense, it is “what actors make of it” (Wæver 1995, 1997, 2008). ‘Human security’ refers to a fundamental shift in the referent object of security from the state world (national, regional, international or global security) to a people-centred approach, where not only human beings, families, and communities constitute a ‘referent object’, but so does humankind.

- Conflict refers in the social sciences to a contest between two or more actors (individuals, societal groups, states, or groups of states) over scarce and sought-after material and immaterial goods, where the parties pursue contradictory aims or means. Conflicts may be distinguished with regard to the object as political, economic, environmental, societal, or social, but also as disputes over competing values, ideologies, interests, social systems, or ways of life, and with regard to the means as peaceful, violent, or devastating. Social conflict

2 The Anthropocene refers to the period of earth history since the industrial revolution when production and consumption patterns have had direct impacts on the earth system. On the history of dealing with climate change see: Brauch (1996), Graßl (2009, 2009a).

3 See on the global reconceptualization of security since 1990 the three volumes of the Global Human and Environmental Security Handbook for the Anthropocene edited by Brauch, Oswald Spring, Mesjasz et al. (2008, 2011) and Brauch, Oswald Spring, Grin et al. (2009) with an extensive bibliography on the security concept.

1 This introduction partly relies on previous texts by Brauch (2008, 2009, 2009a; Brauch/Oswald Spring 2009; Oswald Spring/Brauch 2011; Brauch/Dalby/Oswald Spring 2011) and Scheffran (1997, 2008, 2008a, 2009, 2011; Scheffran/Battaglini 2011), where many of the key concepts, ideas, and evidence have been developed in detail and extensively referenced.
refers to a perspective “in which conflict permeates and shapes all aspects of human interaction and social structure, or as one of the innumerable specific fights or struggles such as wars, revolutions, strikes or uprisings” (Kriesberg 1996: 122).4

- **Stability** has been a widely used concept in the natural, engineering, and social sciences.5 In political science stability refers to a status of order, durable firmness, reliability, and predictability of the institutional and processual dimensions of politics, including the capacity to deal with internal and external challenges while maintaining an equilibrium (Schmidt 2004: 686).6

Linking these four concepts and problem areas from the natural and social sciences requires scientific concepts, approaches, models, and theories that cross the boundaries between the narrow disciplinary analyses and assessments that still prevail in the organization and funding of scientific research. The American biologist Edward O. Wilson (1998) noted a growing **consilience** (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”.

Thus, the key problem that will be addressed in this book is the complex linkage between anthropogenically induced changes in the climate system and their societal outcome as multiple forms of conflicts that sometimes lead to violence or societal instability, and how the latter can be managed, prevented, or avoided. To this end, reactive or proactive political

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4 This is based on Schmidt (2004: 371–372); Strasser (1998: 316–319); Kriesberg (1996).
5 The term ’stability’ refers in British English (Shorter Oxford English Dictionary) to “firmness or steadiness of character, resolution, steadfastness, mental soundness” (Oxford 2002: 2990) and in American English (Webster’s Third New International Dictionary of the English Language) to “quality, state or degree of being stable as a) the strength to stand or to endure… ; b) the state of being in stable equilibrium ; c) the property of a body that causes it ; d) resistance to decomposition” (Gove 2002: 2217). Searching the term ‘stability’ in the Guardian’s website [www.guardian.co.uk], the first 10 hits include “international stability”, “stability director at the Bank of England”, “stability [in Libya]”, “stability of food supplies”, “financial stability”, “stability in the Balkans”, “a continent of peace and stability”, and “stability for Iraq”.
6 Regarding the stability concept in complexity science, security, and environmental policy see: Scheffran (1983, 1989, 1996, 2008b).

strategies, policies, and measures can address the cause by reducing greenhouse gas (GHG) emissions and can address the impacts by political adaptation and mitigation measures to avoid an escalation into violent conflicts.

This goal is being addressed by the excellence cluster Integrated Climate System Analysis and Prediction (CLiSAP) at the University of Hamburg, where meteorologists, oceanographers, and ecologists cooperate with social scientists and economists, as well as with peace and conflict researchers and media scientists. In this cluster members of the university, of the Max Planck Institute for Meteorology in Hamburg, and of the Institute for Coastal Research of the Helmholtz-Zentrum Geesthacht cooperate. In the vicinity of this excellence cluster the KlimaCampus Hamburg has emerged. Within this context a professorship (chair) of climate change and security was established in August 2009 connected to the Institute of Geography and offering the framework for the Research Group Climate Change and Security (CLISEC).7 CLISEC conducts multidisciplinary research and education on the potential security risks, social instabilities, and conflicts induced by climate change, and on possible strategies for international cooperation, conflict management, and sustainable peace. Current research focuses on the development of data and modelling tools suitable for assessing and stabilizing climate-society interaction at global and local scales, with a specific emphasis on regional climate hot spots.

CLISEC’s international conference “Climate Change, Social Stress and Violent Conflict – State of the Art and Research Needs” in Hamburg on 19–20 November 2009 brought together national and international experts to explore research needs and discuss the main elements of the current ’state of the art’ in terms of knowledge about the security implications and conflict potential of climate change (see the key issues and guiding questions in box 1.1).

This book is based on selected papers that were presented at this conference and were evaluated by at least two anonymous peer reviewers and carefully revised and approved by the responsible co-editor. Additional chapters were commissioned. Based on the accepted texts, this book has developed the initial research questions further. The authors, coming from many scientific disciplines – primarily the social sciences, geography, political science, and economics, but also from physics and law – have contributed to the
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1.1.2 From the Holocene to the Anthropocene: Climate Variability vs. Anthropogenic Change

In earth history, the Holocene began with the end of the glacial period about 12,000 years ago, which led to the onset of major human progress and the development of advanced civilizations in the Mediterranean, China, India, and Mesoamerica. In earth history and human history, a fundamental change has occurred since the Industrial Revolution (1750) and Watt's invention of the steam engine (1782) from the 'Holocene' to the 'Anthropocene'. This is due to increasing human interventions, especially the burning of fossil energy that has resulted in an anthropogenic period of climate change. The 'Anthropocene' is an informal geological-chronological term that refers to the global impact of human activities on the earth's ecosystems. The term was coined by the Nobel laureate in chemistry Paul Crutzen (2002, 2006, 2011) and by ecologist Eugene Stoermer (Crutzen/Stoermer 2000), who argue that the influence of human behaviour on the Earth's atmosphere has constituted a new ecological era. According to Crutzen (2002), the Anthropocene is "a new geologic epoch in which [hu]mankind has emerged as a globally significant – and potentially intelligent – force capable of reshaping the face of the planet" (Clark/Crutzen/Schellnhuber 2004; 1; Ehlers/Kraft 2001, 2006; Ehlers 2008).

The 'Holocene' is a period of geological transition with dramatic environmental change, in particular major sea level rise resulting from the melting of the huge ice sheets covering large areas of the northern hemisphere. Bond, Kromer, Beer et al. (2001) postulated a 1,500-year cycle throughout the Holocene with an important contrast in hydrological circulation patterns. These changes in climate have had a major influence on the development and collapse of advanced civilizations (Fagan 2004; Diamond 2005; Bluemel 2009: 104). The Roman Empire coincided with the 'Roman optimum' while its collapse occurred during a cooler period when massive migration of peoples occurred from Central Asia to Europe and from Northern Europe to the Mediterranean (Issar/Zohar 2004: 14, 2007: 12, 2009: 125). The next climatic downturn led to the "little ice age" (Fagan 2000, 2002; Zhang/Zhang/Lee et al. 2007; Tol/Wagner

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Box 1.1: “Climate Change, Social Stress and Violent Conflict – State of the Art and Research Needs”, CLISEC Conference, Hamburg, 19-20 November 2009.

Key issues:
- The increase of resource competition between major powers (e.g. in the Arctic) and strategies with additional risks and conflicts (e.g. nuclear power, bioenergy, geo-engineering).
- The erosion of social order, state failure, and violence in the worst-affected regions that can destabilize regions and overstretch global and regional governance structures.
- Conflicts that spill over to neighbour states, e.g. through refugee flows, ethnic links, environmental resource flows, or arms exports.
- The magnitude and diversity of risks associated with global warming that could trigger a sequence of cascading events, involving environmental degradation, economic decline, social unrest, and political instability, threatening human security and societal stability and leading to violent conflict.
- The increase of resource competition between major powers (e.g. in the Arctic) and strategies with additional risks and conflicts (e.g. nuclear power, bioenergy, geo-engineering).

Guiding questions:
- What are the major causal chains between climate change and violent conflict, and what is the empirical basis for these linkages, revisiting previous assessments of environmental conflict?
- Which approaches, methods, and theories are helpful for analysing the links between climate change, social stress, and violent conflict?
- Is it adequate to call climate change a threat to national or international security?
- Are broader security concepts (such as environmental or human security) useful for evaluating the violence risks of climate change?
- What is the likelihood, potential damage, and resulting risk for violent conflict of water and food scarcity, mass migrations, and natural disasters induced by climate change?
- Will the international community face more violent conflict or more cooperation on climate change and the use of natural resources?
- What are the most likely and most adequate responses of the world’s policymaking and governance structures when addressing the climate-conflict nexus, and what can institutions contribute?
2010) and this coincided with bad harvests, famines, pandemics (plague), and the Thirty Years’ War (1618–1648).

The role of the earth’s climate throughout history as a cause, trigger, or intensifier of the decline and fall of civilizations (Diamond 2005), of massive migrations of peoples (‘Völkerwanderung’), and of violent conflicts and wars (Lee 2009) has been disputed between climate determinists and climate sceptics (Brown 2001). Since the 1930s the anthropogenic model has placed all the blame on human malpractice (Issar/Zohar 2004, 2007). The neo-deterministic paradigm “emphasizes the dynamic interaction between the natural environment ... and the human society” (Issar/Zohar 2009: 110–120). Many neo-determinists have argued that during the Holocene cold periods, precipitation changes, and long periods of drought have triggered massive population movements.

Due to natural climate variability, longer periods of drought and famine contributed to the sudden collapse of advanced civilizations (Diamond 2005). However, analogies between the Holocene and the Anthropocene of the cases of assumed linkages between climate change and violent conflicts and wars (Dyer 2008; Lee 2009; Welzer 2008; Leggewie/Welzer 2009) are hardly possible, as the projected physical effects of anthropogenic climate change up to 2100 will be ‘in addition’ to the natural variability that will also continue.

Since the late 19th century, several authors have referred to human intervention in nature (Marsh 1864, 1965; Stoppani 1873; Vernadsky 1926, 1998) and in the earth system, facilitated by major population growth (Malthus 1798; Zlotnik 2011; UNPD 2011) as a result of technological and medical advances and the availability of cheap fossil energy sources (McNeill 2000, 2009). Crutzen (2006: 13–17) pointed to the chemical impacts of human activities during the Anthropocene resulting in increasing air pollution, acidification of precipitation, and major changes in land use (Vitousek/Dantonio/Loope et al. 1996; Müller/Lotze-Campen/Huber et al. 2011).

1.2 The Discourse on Climate Change, Human Security, and Violent Conflict

The interest of policymakers in the climate change and security nexus has differed with regard to national, international, and human security:

- From the perspective of US national security, the interest of the defence and intelligence community is in how the US military can continue to operate in a world where climate change impacts are increasing and in how the US can maintain its position as the single military superpower and influence outcomes in the interest of its own national security. Thus, the focus is primarily on conflict management but also on conflict prevention.

- From the perspective of international security, many UN member states have emphasized in the General Assembly (UN 2009) and in the Security Council (UN 2007, 2011) the need to prevent climate change becoming a ‘threat multiplier’ that may trigger a violent escalation of the manifold existing conflicts by strengthening sustainability strategies, policies, and measures, and thus to strengthen efforts to minimize security threats, challenges, vulnerabilities, and risks. A major focus has been on preventing conflicts from escalating into violence triggered by the physical and societal impacts of climate change.

- From the perspective of human security, the goal has been to avoid climate-induced violent conflicts occurring that would affect the livelihood of human beings, most particularly those with the highest degree of social vulnerability in the poorest countries who lack the capacities for proactive adaptation and mitigation and whose capacity for resilience is limited.

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9 The urban Late Uruk society in Mesopotamia suddenly collapsed at about 3200–3100 BP due to a short but severe drought (Weiss/Bradley 2001). The collapse of the Mycenaean Kingdom, the Hittite Empire in Anatolia, and the Egyptian Empire (3206–3150 BP) were due to a persisting drought (Drew 2000; Weiss 1982). Between 810 and 910 AD, several mega-droughts occurred in the Yucatán Peninsula and in the Petén Basin that resulted in land degradation (Coe 1999: 26–27; Braswell 1990) and the collapse of the Mayan civilization (Demarest 2004; Demarest/Rice/Rice 2004; Sabloff 1990; Gill 2000). In China, the decline of the Tang (850–940), the Yuan (1340–1360), and the late Ming period (1580–1640) were all related to a reduction of the monsoon and to severe droughts.
1.2.1 The Early Phase of the Debate

The discussion on the linkage between climate change, security, and conflicts has been conceptually influenced by three earlier phases of the research on environmental security, especially by the work of the Toronto Group (Homer-Dixon 1991, 1994, 1999; Homer-Dixon/Deltingannis 2009) and the Swiss EN-COP Project (Bächler 1998, 1999, 1999a; Bächler/Boge/Klölzli et al. 1996; Bächler/Spillmann 1996, 1996a; Bächler/Spillmann/Suliman 2002; Mason/Hagmann/Bichsel et al. 2009).

Based on research into environmental conflict, the debate on the security implications of climate change began at the end of the 1980s. At the “World Conference on the Changing Atmosphere - Implications for Global Security” in June 1988 in Toronto, Gro Harlem Brundtland, the Prime Minister of Norway, said that “the impact of world climate change may be greater than any challenge mankind has faced, with the exception of preventing nuclear war”. Two research papers were published as early as 1989 (Brown 1989; Gleich 1989), but only a few publications addressed the issue during the 1990s (Swart 1996; van Ireland/Klaassen/Nierop et al. 1996; Scheffran/Jathe 1996; Scheffran 1997; Edwards 1999; Rahman 1999).

The climate-security nexus has gradually been taken up since 2000 (Brauch 2002; GECHS 2005; Gleditsch/Nordas 2007; Bohle/O’Brien 2007). A new phase was entered when the debate on the securitization of climate change was driven by political analysts and policymakers. This included reports by consultants (BMU 2002; Schwartz/Randall 2003/2004; CNA 2007), by national governments (Germany: WBGU 2007, 2008; USA: NIC12), supranational institutions (EU 2008, 2008a), and international organizations (UN 2007, 2009, 2009a, 2011) and regimes (Figure 11, see her foreword in this volume).13

The policy debate reached the UN Security Council (UNSC) on 17 April 2007 (chap. 33 by Kurtz) during the British UNSC Presidency and again on 20 July 2011 during the German UNSC Presidency.

The year 2007 was a turning point in the securitization of climate change, when the Intergovernmental Panel on Climate Change (IPCC, 2007, 2007a, 2007b, 2007c) released its Fourth Assessment Report (AR4) and the Nobel Peace Prize was awarded to the IPCC and to Al Gore. Since 1989, and increasingly since 2000, several studies have argued that the projected impacts of temperature increase, sea level rise, and natural hazards will most likely pose severe societal and political challenges for the affected regions and countries that may possibly lead to multiple security problems. These may force people to migrate, protest, and rebel, and in the worst case this may lead to small-scale violence and to resource conflicts.

1.2.2 Climate Change and National Security

In the middle of the last decade, the securitization of climate change also reached the traditional securitizing actors, namely the national defence ministries, the military establishments, and the intelligence community. These have all begun addressing climate change as a new threat to national security. Climate change as a national security issue slowly began to take off in the USA in February 2004 when a study by Schwartz and Randall (2004) for the US Department of Defense was leaked to the press. In spring 2007, a report on National Security and the Threat of Climate Change by the US Center for Naval Analyses (CNA 2007),14 and in November 2007, a second report on The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change (Campbell/Lennon/Smith 2007) by the Center for Strategic and International Studies (CSIS) and the Center for a New American Security (CNAS) triggered a policy debate on climate change and US national security that has been taken up by the administrations of George W. Bush and Barack Obama (Brauch 2011).

In the UK, the British Ministry of Defence (MoD) and its Development, Concepts and Doctrine Centre have identified climate change as a key strategic trend.15 The UK’s Chief of Defence Staff has sug-

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10 This text partly relies on Brauch (2009) and Brauch/Oswald Spring (2011a).
11 Philip Shabecoff, “Norway and Canada Call for Pact to Protect Atmosphere”, in: New York Times, 28 June 1988; at: http://query.nytimes.com/gst/fullpage.html?res=940DEeDA163BF93BA157550C9A96E9A8&sec=\&pagewanted=print.
12 See the list of commissioned National Intelligence Council (NIC) studies (2009) on the projected climate change impacts for US national security: “The Impact of Climate Change to 2030”, Commissioned Research and Conference Reports, 2009–2010; at: http://www dni.gov/nic/special_climate2030.html.
13 These policy proposals and debates have been analysed by Brauch (2009).
14 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 Center on 14 May 2007.
15 The UK’s Chief of Defence Staff has sug-

gested that climate change is a threat to global security that military planners must include into their calculations. In September 2007, the MoD awarded a £12 million research contract to the UK Met Office Hadley Centre that calls for identifying those world regions “where global warming could spark conflict and security threats, as well as predict the likely conditions in which British forces may have to deploy in the future”.

In some countries, climate change has been addressed in national security documents (chap. 8 by Brzoska), and the defence ministries of several NATO countries have launched studies to analyse the implications of the climate-change security nexus for their defence planning processes.

1.2.3 Climate Change and International Security in the EU

Three related events, the publication of the fourth IPCC Assessment Reports, the debates in the United Nations (Security Council [UNSC] and General Assembly [UNGA]), and the award of the Nobel Peace Prize to the IPCC, have imparted high political visibility to climate change and its impacts. Germany responded to this during its dual presidency of the EU and of G-8, while the UK took the lead in putting this challenge on the agenda of the UNSC. In 2002, a report for the German environment ministry (BMU) focused on the causes of climate change and their complex interactions with other drivers of global environmental change (GEC), especially those environmental factors that contribute to environmental stress as a driver causing or triggering potential conflictual or cooperative outcomes (Brauch 2002). Based on a report on Climate Change as a Security Risk by the German Advisory Council on Global Change (WBGU 2007, 2008), released just prior to the G-8 summit in Heiligendamm in June 2007, the German government proposed an EU strategy paper on the security impacts of climate change. In June 2007 the European Council asked Javier Solana and the European Commission to draw up a report on the security issues of climate change.

The German Advisory Council on Global Change (WBGU 2007, 2008) argued in Climate Change as a Security Risk 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”. But a positive development would also be possible if the international community that “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”. Key arguments of this report are reflected in the paper by the European Commission and Javier Solana, approved by the European Council on 14 March 2008.

The security aspects and implications of climate change have since been considered by government representatives within the Organization on Economic Cooperation and Development (OECD) and between the British Foreign Office (FCO) and the German Environment Ministry (BMU) since 2001. The public policy debate on the securitization of climate change has evolved in the UK since 2004 when ministers and high-level policy advisers, leading scientists, and retired diplomats addressed this linkage (Stern 2006, 2009).

In October 2006, Margaret Beckett, the UK Foreign Secretary, considered climate change 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”. UNSC Res. 1625 of 14 September 2005 had already called for promoting sustainable development as part of a broad strategy of

15 See Abbott (2008: 10); Development, Concepts and Doctrine Centre: The DCDC Strategic Global Trends Programme, 2005-2036 (Ministry of Defence, December 2006); at: <www.dcdc-strategictrends.org.uk>.
16 See at: <http://www.mod.uk/DefenceInternet/AboutDefence/People/Speeches/ChiefStaff/ClimateChangePoliticsVsEconomics.htm>.
17 See Abbot (2008: 10); “Met Office climate change study could help identify future security threats”, in: Defence News (11 September 2007); at: <http://tinyurl.com/ jyrscq>.
18 See for details the WBGU website at: <http://www.wbgu.de/wbgu_jg2007_engl.html>, where several expert studies are also available for download at: <http://www.wbgu.de/wbgu_jg2007_kurs_engl.html> and the full report is at: <http://www.wbgu.de/wbgu_jg2007_engl.pdf>.
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>.
conflict prevention. This linkage was explicitly stressed in the UK’s concept paper that put climate change on the agenda of the UNSC on 17 April 2007.

Among the countries that supported this ‘securitizing move’, Sindico (2007) distinguished three groups: a) those wanting to raise global awareness of climate change (UK), b) those focusing on conflict prevention (Germany, France), and c) the most vulnerable small island states. The opponents argued that climate change as a sustainable development issue should not be considered by the UNSC but by the UNGA and the Economic and Social Council (ECOSOC). By taking climate change to the UNSC, it has been upgraded from an environmental and development to a security issue.

On 14 March 2008, the Council of the European Union released a paper on “Climate change and international security” (S113/08) that reflected key arguments of the 2007 WBGU report. The report specifically recommended enhancing capacities at the EU level (building up knowledge, assessing the EU’s own capacities, improvement in the prevention of and preparedness for early responses to, disasters and conflicts). With regard to “cooperation with third countries” the paper calls for “revisiting and reinforcing EU cooperation and political dialogue instruments, giving more attention to the impact of climate change on security”. The paper argued that “this could lead to greater prioritization and enhanced support for climate change mitigation and adaptation, good governance, natural resource management, technology transfer, trans-boundary environmental cooperation ..., institutional strengthening and capacity building for crisis management”. The EU has thus taken up the conceptual and political debate on the securitization of climate change in the UK and in Germany, and hence the European Council has become a major securitizing actor in translating the scientific messages into concrete policy proposals that will lead to action in the years to come.

Since 2007, many international organizations have worked on climate change. In March 2008 the World Bank addressed the “Social Dimensions of Climate Change” (Meade/Norton 2009), and in September 2009 it published its World Development Report 2010: Development and Climate Change.

1.2.4 Climate Change and International Security at the UN

On 17 April 2007, four years prior to the debate in the UNSC on 20 July 2011, the UNSC addressed climate change as an international security issue for the first time, and the UN General Assembly held a special thematic debate on Climate Change as a Global Challenge. Climate change was increasingly being addressed as a new objective security danger and subjective security concern for the livelihood and survival of humankind.

The policy debate on the possible security implications of global climate change culminated on 20 July 2011 during the German Presidency of the United Nations Security Council (UNSC) in a Presidential Statement (S/PRST/2011/15; 20 July) that reflected the lowest common denominator of a controversial debate, in which 65 speakers, including the Secretary-General of the United Nations, Ban Ki-moon, and the Executive Director of the United Nations Environment Programme (UNEP), Achim Steiner, participated. While Russia and China and many representatives of the Group of 77 (G77) opposed the discussion of climate change as a security concern by the UN Security Council, a coalition of OECD countries, including all EU states, the USA, Canada, Japan, South Korea, Australia, New Zealand, and the Pacific Small Island States, stressed the need to address in the UNSC the linkage between climate change and its potential security implications from a proactive perspective.

This debate was prepared by a ‘Concept Note’ of 19 July 2011 from the Permanent Mission of Germany to the UN in New York referring to the previous debate in the UNSC in April 2007 on “the

20 Joint paper by the Commission and the Secretary-General/High Representative concerning “Climate change and international security” to the European Council, Brussels, 3 March 2008; at: <http://euractiv.com/29/images/SolanaCCsecurity%20reportpdf_tcm29-470886.pdf>.

21 See: “Press Conference by Security Council President, 4 April 2007”; at: <http://www.un.org/News/briefings/docs/2007/070404_Parry.doc.htm>; UN Security Council, SC/9000, 3663th meeting, 17 April 2007; “Security Council holds first-ever debate on impact of Climate change on peace, security, hearing 30 speakers”; at: <http://un.org/news/press/docs/2007/sc9000.doc.htm>.

22 Statement by the President of the Security Council on “Maintenance of Peace and Security: Impact of Climate Change”, S/PRST/1011/15, 20 July 2011; at: <http://un.org/docs/pdf/UNDOC/GEN/N11/424/28/PDF/N1142428.pdf?OpenElement>.
link between energy, security and climate (S/PV.5663), to the UNGA resolution A/RES/63/281 (3 June 2009), and to the Secretary-General’s 2009 report (A/64/350; see chap. 33 by Kurtz). The ‘Concept Note’ suggested that the reporting of the UN Secretary-General should take “the security implications of climate change and its impact on resource availability into account in conflict analysis, mission planning and mission monitoring. The same applies to peacebuilding activities.” To structure the debate in the UNSC, the ‘Concept Note’ referred to the special security implications of climate change caused by sea level rise and the food security nexus.

In his remarks to the press, the President of the Security Council, the German Ambassador Peter Wittig, stressed that “the Council acted in a preventive mode” and that this initiative “was directed to prevent new emerging conflicts of this century”, noting that the SC “recognizes the potential threat of climate change to international peace and security” and that it asks the Secretary-General “to report on security implications of climate change in his reporting”, implying a “kind of mainstreaming of the security implications of climate change in the system of the reporting of the Secretary-General”, thus “recognizing the potential threat of climate change to international peace and security”.

During the 7 hours of debate on 20 July 2011 there were 13 references to ‘human security’. The Secretary-General, Ban Ki-moon, noted in his opening statement that

> Competition between communities and countries for scarce resources, especially water, is increasing, exacerbating old security dilemmas and creating new ones. Environmental refugees are reshaping the human geography of the planet, a trend that will only increase as deserts advance, forests are felled and sea-levels rise. Mega-crisis may well become the new normal. Those are all threats to human security, as well as to international peace and security [in the following quotes, emphasis in italics is added by HBG/JS].

The delegate from El Salvador, Mr García González, argued that “Climate change ... reduces economic growth and social progress, multiplies and magnifies territorial vulnerability and exacerbates environmental degradation, and thus constitutes a human security problem”. The representative of the European Union, Mr Pedro Serrano, also stressed that “access to water and water availability may be both a great human security threat and a threat to regional stability, which may lead to serious disputes”.

Ms Štiglic of Slovenia stressed that “climate change has detrimental effects on human security and well-being, it endangers economic development and efforts to eliminate poverty and has a negative impact on international peace and security”. Mr Osuga (Japan) stated that “most countries have no doubt that climate change threatens human security and, in the long term, would have indirect adverse effects on national security as well”. He stressed that Japan “remains fully committed to providing assistance to Pacific island countries ... in other areas as well, such as the environment and human security, including health and education.” Mrs Atimova argued that Kazakhstan “understands the rationale for discussing the subject in the Security Council, because at present the effects of climate change pose a serious threat to human security”. Mr Kamau also stressed that for Kenya climate change presents a real and present danger that consistently haunts the existence and lives of our people. This happens in five key dimensions. The first is human security; the second is economic security; the third is national security in the collective sense; the fourth is in the context of peace and stability; and the fifth is in the context of trying to find solutions for these issues. Insofar as human security is concerned, for us climate change impacts on the lives and livelihoods of Kenyans ..., they impact in ways in which lives are lost, children suffer and we all collectively find ourselves in a spiral of deteriorating circumstances. The food security situation in our country ... are conditions that are directly correlated to the human security of our people and their livelihoods.

Mr Tachie-Manson (Ghana) also stressed that “the impact of climate change has implications for human security. ... The areas in which climate change has led to conflict are mainly where the capacity of the population to adapt to changing conditions is weak and it is susceptible to conflict.” Mr De Laiglesia (Spain) argued that the UNSC had previously discussed HIV/AIDS and “in that same spirit that we ought to address the issue of climate change, which is a genuine threat to peace that has enormous consequences not only for countries’ security but also for human security.”

This brief review of the UN Security Council debate of 20 July 2011 indicates that a few delegations (EU, Slovenia, Spain, Kenya, Ghana, El Salvador, Ka-
zakhstan, Japan) associated the climate change debate in the UNSC with the human security concept, while during the specific informal thematic (2008, 2011) and formal (2010) debates in the General Assembly on Human Security on 22 May 2008,24 on 20 and 21 May 2010,25 and on 14 April 2011,26 most countries referred to climate change as one of the major threats for human security.

1.3 Human Security Concepts and Discourses

From a human security perspective, climate change has been addressed by the Global Environmental Change and Human Security (GECHS) programme of IHDP in June 2005 and was the focus of the Greek Presidency of the Human Security Network (2007–2008)28 that aimed “to raise the international community’s awareness of the impact of climate change and global warming on human security, with regard to vulnerable groups, particularly women, children and persons fleeing their homes due to climate change”.29 A policy memorandum on ‘Climate Change and Human Security’30 (Wisner/Fordham/Kelman et al. 2007) pointed to manifold impacts for international, national, and human security for selected direct, indirect, and slow-onset linkages. The conceptual debate on climate change and human security is just starting. Barnett and Adger (2005: 1) discuss how climate change may undermine human security, and how human insecurity may increase the risk of violent conflict; they also discuss the role of states in human security and peace-building. The link between climate change and human security is currently being addressed by Working Group (WG) II of the IPCC, and its fifth assessment report will be released in 2014.

In the following sections we will summarize the policy and scientific debates on human security in the context of climate change.

1.3.1 The Policy Debate on Human Security at the United Nations

How did the Secretary-General define human security, and did he refer in his reports to the General Assembly on climate change (2009) and on human security (2010) to climate change as a threat to human security? In his report on human security (A/64/701) of 8 March 2010 the Secretary-General offers an update on developments related to the advancement of human security since the 2005 World Summit, where governments committed themselves to “discuss and define the notion of human security”. This report identifies core elements and the added value of human security:

Human security is based on a fundamental understanding that Governments retain the primary role for ensuring the survival, livelihood and dignity of their citizens. It is an invaluable tool for assisting Governments in identifying critical and pervasive threats to the welfare of their people and the stability of their sovereignty. It advances programmes and policies that counter and address emerging threats in a manner that is contextually relevant and prioritized. This helps Governments and the international community to better utilize their resources and to develop strategies that strengthen the protection and empowerment framework needed for the assurance of human security and the promotion of peace and stability at every level - local, national, regional and international.31

The Secretary-General’s Report stated that “broadly defined, human security encompasses freedom from

24 See the analysis of the first debate in Brauch (2009), his statement in the third debate on 14 April 2011 at: <http://www.un.org/en/ga/president/65/initiatives/Human%20Security/DrBrauch.pdf>, and the report on this meeting at: <http://www.un.org/News/Press/docs/2011/ga11072.doc.htm>.
25 On 8 March 2010, the UN Secretary-General Ban Ki-moon released a report on human security (A/64/701).
26 On 8 March 2010, the UN Secretary-General Ban Ki-moon released a report on human security (A/64/701).
27 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 are at: <http://www.cicero.uio.no/humsec/list_participants.html>.
28 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>.
29 See Greece, Foreign Ministry at: <http://www.mfa.gr/www.mfa.gr/Articles/en-US/tsi8032007_KL2115.htm>.
30 See the memorandum written by Wisner, Fordham, Kelman et al. (2007).
fear, freedom from want and freedom to live in dignity” and that

threats such as natural disasters, violent conflicts and their impact on civilians, as well as food, health, financial and economic crises, tend to acquire transnational dimensions that move beyond traditional notions of security. While national security remains pivotal to peace and stability, there is growing recognition of the need for an expanded paradigm of security. ... As a result, the guarantee of national security no longer lies in military power alone. Essential to addressing security threats are also healthy political, social, environmental, economic, military and cultural systems that together reduce the likelihood of conflicts, help overcome the obstacles to development and promote human freedoms for all.

The Secretary-General also referred to the initial definition in the Human Development Report by the United Nations Development Programme (UNDP 1994) that broadly defined human security as “freedom from fear and freedom from want” and noted that “four basic characteristics (universal, people-centred, interdependent and early prevention) and seven key components (economic, food, health, environmental, personal, community and political security) were presented as the main elements of human security”.

Five years later, the Human Security Network (HSN; Fuentes/Brauch 2009) defined human security as:

A humane world ... where every individual would be guaranteed freedom from fear and freedom from want, with an equal opportunity to fully develop their human potential ... In essence, human security means freedom from pervasive threats to people’s rights, their safety or even their lives ... Human security and human development are thus two sides of the same coin, mutually reinforcing and leading to a conducive environment for each other.

In its report Human Security Now: Protecting and Empowering People, the UN Commission on Human Security (CHS 2003) defined the goal of human security as being

...to protect the vital core of all human lives in ways that enhance human freedoms and human fulfilment. Human security means protecting fundamental freedoms – freedoms that are the essence of life. It means protecting people from critical (severe) and pervasive (widespread) threats and situations. It means using processes that build on people’s strengths and aspirations. It means creating political, social, environmental, economic, military and cultural systems that together give people the building blocks of survival livelihood and dignity.

This definition has been adopted as the working definition of human security by the Friends of Human Security, an informal network that has met since 2007 at UN Headquarters. The Secretary-General’s report pointed to these commonalities of the human security concept:

Common to all the above definitions are three essential components that encompass the principles of human security and help further explore the added value of the concept. First, human security is in response to current and emerging threats – threats that are multiple, complex and interrelated and can acquire transnational dimensions. Second, human security calls for an expanded understanding of security where the protection and empowerment of people form the basis and the purpose of security. Third, human security does not entail the use of force against the sovereignty of States and aims to integrate the goals of freedom from fear, freedom from want and freedom to live in dignity through people-centred, comprehensive, context-specific and preventive strategies.

The Secretary-General’s report further noted:

The concept of human security acknowledges that due to catastrophic events people may be faced with sudden insecurities and deprivations that not only undo years of development but also generate conditions that may lead to growing tensions. As a result, human security draws attention to a wide range of threats faced by individuals and communities and focuses on the root causes of such insecurities. In addition, by understanding how particular constellations of threats to individuals and communities translate into broader intra- and inter-State security breaches, human security seeks to prevent and mitigate the occurrence of future threats, and in this regard can be a critical element in achieving national security and international stability.

The human security report of Secretary-General Ban Ki-moon argued that

human security underscores the universality and primacy of a set of freedoms that are fundamental to human life, and as such it makes no distinction between civil, political, economic, social and cultural rights, thereby addressing security threats in a multidimensional and comprehensive manner. In this way, the human security concept introduces a practical framework for identifying the specific challenges that are at stake in a particular situation of insecurity as well as for considering the institutional and governance arrangements that are needed to ensure the survival, livelihood and dignity of individuals and communities. Improve-

31 This quote is from the summary of the SG’s report on “Human Security” (A/64/701) of 8 March 2010 at: <http://www.humansecuritygateway.com/documents/UNGA_A64701_ReportOfTheSecretaryGeneralOn_HumanSecurity.pdf>.  

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ments in human security directly and positively impact people’s daily lives and as a result give rise to more immediate and tangible results that help strengthen the legitimacy of actions taken by Governments and other actors.

The Secretary-General maintained with regard to the nature of the threats and challenges that:

Some human security challenges are specific to the internal dynamics of a particular community, such as lack of access to resources and opportunities, while others are transnational, such as pandemics, climate change and financial and economic crises.

The report referred 13 times to climate change, focusing specifically on “Climate change and the increase in the frequency and intensity of climate-related hazard events” and noting its “multidimensional impact”:

Climate change and its interactions with other insecurities is one of the most pressing issues of our time. Among its many consequences are an increase in the frequency, variability and intensity of events such as floods, storms, desertification and droughts. Climate change also exacerbates poverty. Climatic fluctuations, environmental degradation and extreme weather patterns disrupt harvests, deplete fisheries, erode livelihoods and increase the spread of infectious diseases. Vulnerable groups are particularly at risk, not only from the immediate impacts of climate-related disasters but also from knock-on risk factors such as displacement and migration.

As I outlined in my report on climate change and its possible security implications (A/64/350), climate change can also be a ‘threat multiplier’ where the loss of land, coupled with persistent poverty, displacement and other insecurities, may trigger competition over increasingly scarce natural resources that can intensify societal tensions. With a majority of climate-related deaths and economic losses occurring in poor regions, climate change puts an enormous stress on the social and economic systems of poor countries.

Meanwhile, where climate change threatens to exacerbate socio-economic conditions, a better understanding of the interlinkages between climate change and other dimensions of human security is needed. Such an understanding can help assess the causes and identify the actions needed to manage the combined risks of climate-related insecurities. In these fragile spots, special attention from the international community is required to assist countries in reducing the social stresses that emerge when State institutions are overstretched and the delivery of basic services is inadequate.

However, in his earlier report on Climate change and its possible security implications (A/64/350 of 11 September 2009), Secretary-General Ban Ki-moon had not used the human security concept at all, except in a footnote in a citation of the literature.

1.3.2 Scientific Human Security Discourses

In the scientific discourse, the Copenhagen School (Buzan/Wæver/de Wilde 1998) proposed a horizontal widening and vertical deepening of the primarily ‘state-centred’ national and international security concept. As in the political debate in the UN, the scientific discourse on human security and scientific efforts to define this concept have primarily focused on the three pillars of human security:

a) ‘freedom from fear’ addressing the conflict and humanitarian law agenda;

b) ‘freedom from want’ in the context of the human development agenda; and

c) ‘freedom to live in dignity’ the UN Secretary-General Kofi Annan introduced his report On Larger Freedom (Annan 2005) with reference to human rights, the rule of law, and good governance.

In the UN debates, a focus on these three pillars of human security has so far prevailed. No agreement exists in science and politics on the definitions, referent objects, scope, and boundaries, or on the policy goals and human security agendas. The human security concept has been proposed in scientific discourses as an alternative normative paradigm. In the social sciences, the concept has been widely discussed in development studies (Picciotto/Olonisakin/Clarke 2007; Ulbert/Werthes 2008) and peace studies (Tadjbakhsh/Chenoy 2006; Tadjbakhsh 2009; Thakur 2006/2007; Werthes/Debiel 2009), and to a lesser extent in environmental studies (Page/Redclift 2002; Dodds/Pippard 2005) and security studies (Dannreuther 2007; Booth 2007), where many realists have totally ignored this discourse (Kolodziej 2003). Several proponents of a narrow human security concept (Mack 2004; Krause 2004, 2004a; 2008; Mac Farlane/Khong 2006; Black/Swatuck 2009) have opposed its horizontal widening to include other policy agendas of development and environment policy (Brauch 2009).

The paradigmatic shift from ‘national security’ to ‘human security’ implies a change in the reference objects, the values to be protected, and the security dangers and concerns faced by individuals and human-kind and that they have to cope with, as well as in policy agendas and strategies for achieving human security. Human security does not replace the national, regional, or international security of the world of states, but it shifts the focus from nation states to “We the peoples of the United Nations” as referred to in the Preamble of the UN Charter, from sovereignty to human well-being and survival, from the fixation with
the ‘other’ (state, ethnic, or religious group) to ‘us’ as the cause (e.g. of global environmental change and global warming) and the victims of ‘our own consumptive behaviour’ (through an increase in the number and intensity of hydro-meteorological hazards).

Human security requires a fundamental shift in the thinking on security (of worldviews and mindsets, Brauch 2003), as it addresses different policy requirements and needs, and requires horizontally integrated political coping strategies where the role of development and environment policies is vital. The role and missions of the military changes from fighting wars to protecting the people against genocide and natural hazards, where society and social movements have a vital role to play in empowering the people to build resilience and to enhance their coping capacities. Thus, the human security concept implies fundamental changes in the priorities of nation states in fulfilling the basic human needs of its people, to protect its human beings from manifold security dangers and to empower them to cope with these manifold security dangers.

While the theory of securitization was developed by the Copenhagen school for a widened security agenda for a world of states, the human security concepts and policy agendas enhance the role of societal groups and of knowledge-based scientific epistemic communities (such as the Intergovernmental Panel on Climate Change (IPCC)) as new securitizing actors that have put issues of global environmental change and climate change on the top policy agendas of nation states and of the global and regional UN system, the Bretton Woods institutions, and of the G-8, G-5, G-20, G-77, and the European Union (Brauch 2009; Oswald Spring/Brauch 2009, 2011).

The policy debate and the scientific discourse on human security have become an essential part of the broader reconceptualization of security dangers and concerns, focusing on different soft security threats, challenges, vulnerabilities, and risks (Brauch 2011) caused by and affecting the well-being and survival of humankind and human beings alike. Human security has the human being and humankind as a referent object, whose values at risk are human well-being, quality of life, and survival, and whose sources of threat are the state, globalization, and nature (Møller 2003: 279).

While the narrow Canadian conceptualization of human security is limited to the political and military dimension, the wider Japanese notion includes the economic dimension, while the all-encompassing UNDP concept (1994) covers the societal and environmental dimension as well. Human security has been discussed in relationship to national (Durdevic-Lukic 2004), international (Dannreuther 2007), or global security (Stoett 1999) but also in relationship to several sectoral security concepts, especially to water (Oswald Spring/Brauch 2009), soil (Brauch/Oswald Spring 2009, 2011), food (Oswald Spring 2009a), health (Leaning 2009; Leaning/Arie 2000, 2001; Szreter 2003; Chen/Leaning/Narasimhan 2003; Oswald Spring 2011), and livelihood security (Bohle 2009; Bohle/O’Brien 2007). Oswald Spring (2001, 2008, 2009) has proposed a composite concept that links human with gender and environmental security ( HUGE).33

In the scientific discourse since the 1980s, even before the global turn, a few scholars had called for an expanded concept of international security (Westing 1986: 183–203) and for a comprehensive or human security approach (Westing 1993). But the scientific human security discourse was triggered by the UNDP’s (1994) Human Development Report (HDR) in the political science, international relations (Ulbert/Werthes 2008), and more particularly in the peace studies and development communities (McGrew/Poku 2007), but also in geography (Lonergan 1999; Bohle/O’Brien 2007), international law (von Tigerstrom 2007), education (Nelles 2003), philosophy (Fabra Mata 2007), theology (Eisen 2008), and even in the health sciences (Leaning 2009).

Alkire (2003: 15–39; 2003a; 2004) pointed to the many different definitions of human security as: “a) safety from chronic threats such as hunger, disease and repression; b) protection from sudden and hurtful disruption in the patterns of daily life”. The CHS (2003) focused on threats from both poverty and violence and aimed “to protect the vital core of all human lives in ways to enhance human freedoms and human fulfilment”, a goal that should be realized “by joint strategies of protection and empowerment”.

Within international relations, the human security concept has remained controversial. While many neo- or structural realists and the strategic studies community (Paris 2001, 2004), as well as ‘state-centred’ peace researchers (Buzan 2000, 2002; Müller 2002; Brock 2008), have rejected the human security concept, au-

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32 This has been covered elsewhere in detail by Brauch (2005, 2005a, 2006, 2007, 2008) and Barnett (2001).
33 For different perspectives on the linkage between gender and human security see: Truong (2009); Serrano Oswald (2009).
thors with liberal and constructivist perspectives and those from peace research have rallied behind this concept. However, some proponents are critical of wide concepts such as ‘freedom from want’ (Krause 2004; Mack 2004, 2004a) and have argued instead for “pragmatism, conceptual clarity, and analytic rigor” (Owen 2004: 375). But most of the authors of a forum in Security Dialogue (2004) supported a wide agenda that includes ‘freedom from fear’ (violence) and ‘freedom from want’ (development).

Human security as an analytical and theoretical tool differs from human security as a political mandate. Uvin (2004, 2008) uses the concept as a “conceptual bridge between the ... fields of humanitarian relief, development assistance, human rights advocacy, and conflict resolution” (Owen 2004). For Hampson (2004), human security gives ‘voice’ to the politically marginalized, while Acharya (2004) interpreted it as a response to the globalization of international policy, and for others human security is a response to genocide and the limits of sovereignty, justifying humanitarian interventions.

Newman (2001) distinguished four interpretations of human security: basic human needs, an assertive or interventionist focus, social welfare or a development focus, and new or non-traditional security issues such as drugs, terrorism, small arms, and inhumane weapons. The victims of human security challenges have been: “1) victims of war and internal conflict; 2) persons who barely subsist and are thus courting socio-economic disaster; and 3) victims of natural disasters” (Suhrke 1999) that create severe humanitarian emergencies.

To overcome the dispute between the proponents of a narrow and a wide human security concept, Owen (2004) suggested combining the wide definition of UNDP (1994) with a threshold-based approach “that limits threats by their severity rather than their cause”. He suggested that each category of threats should be “treated separately for the purpose of analysis”. For Owen (2004), “human security is the protection of the vital core of all human lives from critical and pervasive environmental, economic, food, health, personal and political threats” regardless of whether people are affected by floods, communicable disease, or war, but all those threats would be included “that surpass a threshold of severity [and] would be labelled threats to human security” (Owen 2004).

Mary Kaldor (2007: 182–187) who headed the Study Group on Europe’s Security Capabilities (Glasius/Kaldor 2005) placed human security “at the sharp end of human development”. Kaldor (2007: 190–191) argued that “physical insecurity is linked with material insecurity. New wars involve high levels of population displacement, rapid urbanization, loss of rural livelihoods, destruction of infrastructure and productive assets, and greater vulnerability to natural disasters.” She suggested that a human security approach to these new security dangers “would aim both to stabilise conflicts and address the sources of insecurity.” This requires public security, Kaldor argued, based on the rule of law and effective law enforcement; for international organizations this implies: a) an expanded international presence; b) new human security forces; and c) a legal framework.

There has also been an intensive scientific discourse on human security concepts and issues among and with scholars from developing countries, in Latin America (Neff 2003; Palma 2003; Kornblith 2003; Bonilla 2003; Lopez 2003; de Lombaerde/Norton 2009; Rojas Aravena 2009; Singh 2009), in South Asia (Aryabandu/Fonseka 2009; Chari/Gupta 2003, 2003a; Abdus Sabur 2003, 2009; Bajpai 2000, 2004; Najam 2003), in South-east Asia (Othman 2009; Wun’Gaeo 2009), in Japan (Shinoda 2009), in Africa (Hendricks 2008; Goucha/Cilliers 2001; Naidoo 2001; Hussein/Gnisci/Wanjiru 2004; Mulongo/Kibasomba/Njeri Kariri 2005; Mutesa/Nchito 2005; Mpalagai/Lwe-habura 2005; Mataure 2005; Ngoy Kaungulu 2005; Correia de Barros 2005; Mlambo 2005; Dzimba/Matooane 2005; Poku/Sandkjaer 2009; Schott 2009), and in the Arab world (Chourou 2005, 2009).

This selective review of definitions of human security and of threats for human security, as well as of issues relevant to human security, indicates both a diversity and a lack of clear consensus, neither of which has helped communication with policymakers or their efforts to move from declaratory statements to concrete policy initiatives and actions. After 18 years of debate on human security in the social and human sciences, the conceptual discourse remains inconclusive, and the definition of human security used depends on the approach and preferences of the respective author or donor.

Both in the policy debate and in the scientific discourses on human security, the environmental security dangers and concerns have in most cases been ignored. But new challenges are being posed by the environmental dimension of human security (Barnett 2001; Brauch 2005, 2005a, 2006, 2007, 2008; chap. 10 by Hardi), and these have led to a proposal for a fourth pillar of human security that is gradually being
taken up by governments in the HSN (Fuentes/Brauch 2009).

1.3.3 Environmental Dimension of Human Security: Freedom from Hazard Impacts

Given the gap in the conceptualization of human security challenges posed by climate change, during the informal debate of the UNGA on 14 April 2011 Brauch addressed “The Environmental Dimension of Human Security”, and proposed a fourth human security pillar as “Freedom from Hazard Impacts”34, arguing that

While hazards cannot be prevented, their impact can be reduced. These hazards did not affect national and international security but they had severe impacts on the human security of human beings and the most affected communities and on their water, soil, food, health and livelihood security. This is the background for a fourth pillar of human security as ‘Freedom from Hazard Impacts’ to deal with the environment, sustainable development and disasters and to include the respective organizations, programmes and initiatives within the UN system.

In 2005, a report for the United Nations University Institute on Environment and Human Security (UNU-EHS) suggested as the fourth pillar of human security ‘freedom from hazard impacts’ focusing on “reducing vulnerability of societies confronted with natural and human-induced hazards” with the goal “to improve the knowledge base for the assessment of vulnerability and coping capacity of societies facing natural and human-induced hazards” (Brauch 2005, 2005a).

‘Freedom from hazard impacts’ calls for reducing the environmental and social vulnerability and enhancing the coping capabilities of societies confronted with environmental, geophysical, and climate-related hazards. It implies that people can mobilize their resources to address sustainable development goals. Human security as ‘freedom from hazard impacts’ is achieved when people who are vulnerable to environmental hazards and disasters (Nathan 2009) that are often intensified by poverty, food insecurity, and improper housing in flood-prone and coastal areas are better warned of impending hazards, and are protected against them and empowered to prepare themselves for them. Brauch argued that putting the environment and natural hazards on the human security agenda means addressing its impacts on water, soil, food, health, and livelihood security. Global environmental change as the outcome of the interaction between the earth and human systems and of direct human interference with nature has become a scientific, political, and security issue since the 1970s. Since 2004, climate change has become a security concern.

A human security perspective on climate change puts human beings, communities, and humankind at the centre, addresses how physical and societal impacts of climate change pose human security dangers, and how human beings, states, and the international community can cope in order to avoid major human catastrophes. As ‘we’ are the threat (through our energy consumption), it is ‘we’ who have to change our consumption and must adapt governance structures to reduce global greenhouse gas emissions. A policy-focused human security approach to climate change prioritizes the climate-induced security threats humankind will face during the 21st century. Its task is to develop policies for coping better with the human security impacts of climate change by measures of mitigation, adaptation, and resilience-building to protect and to empower the affected people. This requires local survival strategies and global strategies for a decarbonization of the world economy.

In a human security approach, non-military means prevail. The development of new scientific knowledge, its technological application, and its effective political implementation matter. Such an approach allows policymakers and scientists to develop coping strategies. Its task is to allocate the resources needed for these policy measures in order to achieve the goals in a proactive manner. This is a fundamental shift from short-termism to a legally binding post-Kyoto regime in order to promote sustainable development and resilience in the poorest countries most affected by climate change, and to recover environmental services for adaptation and mitigation globally.

Global environmental change comprises the interaction of water, soil, climate change, and biodiversity with population change, rural and urban systems, and socio-economic processes that may cause environmental scarcity, degradation and stress, and climate-induced natural hazards. Both may trigger extreme societal outcomes, migration, crises, and conflicts that directly affect human beings, local communities, and humankind.

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34 See this document at: <http://www.un.org/en/ga/president/65/initiatives/Human%20Security/DrBrauch.pdf>; and the UN press release at: <http://www.un.org/News/Press/docs/2011/ga11072.doc.htm>. For a background paper, see at: <http://www.afes-press-books.de/html/PDFs/Brauch_UN-GA_Paper_12%204%202011_final%202(2).pdf>.
From a human security perspective, climate change directly impacts on water, soil, food, health, and livelihood security. Climate change will exacerbate these sectoral security problems if the communities and social groups fail to create mitigation and adaptation strategies with resilience-building through preventive learning and decisions. ‘Freedom from hazard impacts’ addresses the consequences for human security. From a policy perspective, a holistic coping strategy requires better horizontal coordination of strategies, policies, and the measures carried out by ministries and international organizations. The best human security strategy for achieving ‘freedom from hazard impacts’ is to reduce global GHG by 50 per cent globally by 2050. Even if this goal should be achieved, extreme weather events will further increase and may lead to cascading effects triggered by climate change and its physical and societal impacts. ‘Freedom from hazard impacts’ requires a proactive environmental strategy for implementing the three Rio Conventions.

The Secretary-General proposed in his report on Climate change and its possible security implications “several ‘threat minimizers’, ... [to] lower the risk of climate-related insecurity. ... Accelerated action at all levels is needed to bolster these threat minimizers”. These measures could enhance the human security of the people affected most. The daily survival problems of a few billion people, their social vulnerability, and their physical exposure to climate change are creating additional dangers for human security, but also challenges for an integrated human security approach combining all four pillars. Brauch concluded his statement to the UN General Assembly by proposing that:

‘Freedom from Hazard Impacts’ implies a close cooperation between those agencies working on the global environmental agenda and on the hazard agenda. It may be the appropriate time for the United Nations General Assembly to consider adding to the first three pillars of Human Security as

- ‘Freedom from fear’ referring to the policy agenda of peacekeeping, peace-building humanitarian law and disarmament;
- ‘Freedom from want’ referring to the policy agenda of human and sustainable development;
- ‘Freedom to live in dignity’ referring to the policy agenda of human rights, democratic governance and rule of law;
- a fourth pillar as ‘freedom from hazard impacts’ that brings in the policy agendas dealing with global environmental issues as well as natural hazards and disasters (early warning, disaster response, disaster preparedness, resilience building and reduction of social vulnerability).

This volume addresses the multiple societal impacts of climate change from a wider human security perspective and it intends to bring the climate change and hazard agenda into the wider scientific human security discourse and thus contribute to the development of the fourth pillar as ‘freedom from hazard impacts’.

1.4 Concepts and Approaches of Climate Security

1.4.1 Types of Literature

During the 21st century, the causal relationship between the drivers and severe societal outcomes of climate change may result in environmentally-induced massive and forced movements of peoples, hunger and famine-induced protests, and small-scale societal violence, and possibly also in violent conflicts within and between countries; these may present a number of security dangers that are increasingly being addressed by governments and international organizations.

While future climatic scenarios can be simulated and socio-economic trends can be projected, specific events (Gaddis 1992–1993), such as climate conflicts and wars as the outcome of the decisions of future policymakers, cannot be predicted, but rather a number of ‘conflict constellations’ can be foreseen (WBGU 2007, 2008; Bauer 2011) that may possibly escalate into violence. The causal linkages and possible extreme and sometimes fatal societal outcomes have been discussed from four different scientific perspectives:

1. Determinists have claimed that climate change will lead to wars during the 21st century. This argument has been made by scientists (e.g. Welzer 2008; Lee 2009), humanitarian organizations, and NGOs and a few governments.

2. Empiricists have stressed (Dalby/Brauch/Oswald Spring 2009; Oswald Spring/Brauch/Dalby 2009) that environmental stress and climate change have contributed to forced migration and small-scale violence (Kahl 2003, 2006). They have analysed the securitization of climate change impacts (Detraz/Betsill 2009; Brauch 2009; Scheffran 2011) and reviewed conflict constellations triggered by climate change (WBGU 2008; Bauer 2011).

3. Sceptics have pointed to a lack of evidence in the peer-reviewed, quantitative literature on the link
between climate change and wars (Gleditsch/Nordas 2009; Breitmeier 2009).

4. **Deniers** have challenged the links between climate change and conflicts that may present security threats (Lomborg 2009, 2004; Tetrais 2011). Within the context of the UN, Russia, China, and many G-77 countries have considered climate change primarily as an issue of sustainable development, to be addressed by the UNGA, ECOSOC, and the United Nations Framework Convention on Climate Change (UNFCCC), but not as an issue of international peace and security for consideration by the UNSC.

Four different genres of publications may be distinguished:

a) **Policy analyses** by consultants aiming to put the linkage on the policy agenda of national governments and international organizations. This goal has been successfully achieved by putting it on the agenda of the UNGA, the UN Secretary-General, and the UNSC.

b) **Scenario analyses** with the goal of preparing policymakers for potential future security threats posed by the projected societal impacts of climate change. Such studies have been funded by defence ministries, intelligence agencies (US NIC), and supranational (EU 2008) and international organizations.

c) **Discourse analyses** have analysed the policy statements of national and international policymakers and press reports in terms of international, national, and human security (Brauch 2009; Detraz/Betsill 2009; chap. 12 by Rothe; chap. 33 by Kurtz)

d) **Conceptual and model analyses** of the linkage between climate change and society as part of the interactions between natural and human systems (Scheffran 2008, 2008a, 2009, 2010).

e) **Theoretical and empirical analyses** that use a wide range of scientific approaches, theoretical orientations, and methods to analyse the ‘observed’ and ‘projected’ interrelations between four physical effects of climate change (increasing temperature, sea level rise, number and intensity of climate-related natural hazards, and changes in precipitation) on the state, society, and the economic sector and business community, and on individuals, community groups, and humankind.

Work in the first two genres has been carried out primarily by political consultants, and in the third by sociologists, political scientists, and media specialists. The fourth and the fifth require inter-, multi- and transdisciplinary cooperation (Pohl/Hirsch Hadorn 2006) among scientists from the natural and the social sciences.

1.4.2 **Global Risk Society: Precaution and Prevention**

The analysis of the linkages between climate change, human security and violent conflict may challenge Bacon’s influence on “knowledge-based environmentalism” (Marocco 2008: 312–322) through identifying effects (e.g. of climate change), determining their causes (GHG emissions), and addressing these causes through specific measures (e.g. green technologies). Beck has analysed the new predicament of a ‘risk society’ (Beck 1986, 1992) and more recently of a ‘world risk society’ (Beck 1999, 2007, 2011). Starting from the premise “We don’t know what it is we don’t know - but from this dangers arise, which threaten mankind!”, Beck (2011: 11) argues:

The irony of risk is that rationality, that is, the experience of the past, encourages anticipation of the wrong kind of risk, the one we believe we can calculate and control, whereas the disaster arises from what we don’t know and cannot calculate. The bitter varieties of this risk irony are virtually endless: climate change, mad cow decease 9/11 terror attacks, global financial crises, swine flu virus and latest but not last, volcano ash clouds disrupting air traffic in Europe and elsewhere. To the extent that risk is experienced as omnipresent, there are only three possible reactions: denial, apathy, or transformation. The first is largely inscribed in modern culture, the second resembles postmodern nihilism, and the third is the ‘cosmopolitan moment’ of world risk society (Beck 1986, 1992, 2006, 2007, 2009).

Drawing on the empirical research findings of the Munich Research Centre on ‘Reflexive Modernisation’, Beck (2011: 11) developed his argument in three steps:

1. Old dangers - new risks: What is new about world risk society?

2. Ruse of history: To what extent are global risks a global force in present and future world history, controllable by no one, but which also open up new opportunities of action for states, civil society actors etc.?
3. Consequences and perspectives: In order to understand the manufactured uncertainty, lack of safety and insecurity of world risk society is there a need for a paradigm shift in the social sciences?

Beck (2011: 12) argues that his theory of ‘world risk society’ maintains

That modern societies are shaped by new kinds of risks, that their foundations are shaken by the global anticipation of global catastrophes. Such perceptions of global risk are characterized by three features:

1. De-localization: Its causes and consequences are not limited to one geographical location or space, they are in principle omnipresent.

2. Incalculableness: Its consequences are in principle incalculable; at bottom it’s a matter of ‘hypothetical risks’, which, not least, are based on science-induced not-knowing and normative dissent.

3. Non-compensatibility: ... Given this new quality of ‘threats to humanity’ - argues Francois Ewald (2002: 275) - the logic of compensation breaks down and is replaced by the principle of precaution through prevention. Not only is prevention taking precedence over compensation, we are also trying to anticipate and prevent risks whose existence has not been proven.

This principle of precaution through prevention has been instrumental for the British (2007) and German (2011) initiatives in the UNSC but also for the approach taken by the European Union since 2008.

From an interdisciplinary perspective, William C. Clark of the Kennedy School of Government, Harvard University, Nobel laureate Paul C. Crutzen of the Max Planck Institute in Mainz, and Hans Jochen Schellnhuber, director of the Potsdam Institute of Climate Impact Research, have called for a “second Copernican revolution” in science that will result in “a new paradigm for sustainability” (Clark/Crutzen/Schellnhuber 2004) to meet the climate paradox of a 50 per cent reduction of global GHG or of an 80 per cent reduction for the G-8 countries within four decades. They argue that the guidance system for a sustainability transition requires “systems for adaptive management and social learning” whose elements require “appropriate information, incentives, and institutions”. Such reform efforts should mobilize “the right knowledge”, “integrate knowledge”, balance “flexibility and stability”, and address the required “infrastructure and capacity”. They concluded by calling for a new “social contract” between society and the scientific community, an idea that was developed further in a WBGU (2011) report.

This book, by analysing the linkages between climate change, human security, and violent conflict, aims to contribute new knowledge based on a plurality of scientific disciplines, approaches, theories, and methods. In order to develop Beck’s ‘principle of precaution through prevention’, to contribute to the discussion of geopolitical aspects of the required transformation to ‘manage’ conflicts, to ‘prevent’ their escalating into violence and wars, and to contribute to a discussion on a scientific and policy agenda for a ‘sustainability transition’ (Grin/Rotmans/Schot 2010) by addressing a policy priority to ‘avoid’ future climate-induced violent conflicts and to move towards a sustainable peace.

1.4.3 Causal Linkages, Chains, and Feedbacks

Instead of a simple stimulus-response model that claims direct links between stress factors and societal responses, the Pressure-State-Response (PSR) model of the OECD (1994; 1998; 1999; 2001; 2001a) assumes that human activities put pressure on nature that leads to environmental changes (climate change, water and soil degradation, biodiversity loss) to which the state and society respond with ecological and economic measures and programmes.

The OECD’s PSR model distinguishes between ‘pressure’ (P), ‘state of the environment’ (S), and ‘response’ (R) indicators. Under ‘pressure’ key factors are listed (population growth, consumption, poverty), while ‘state’ refers to the environmental conditions that emerge from this pressure (air pollution, deforestation, degradation) that influence human health and well-being, and ‘response’ points to the numerous activities carried out by society to avoid, prevent, and reduce negative impacts on the environment, and to protect natural resources from these effects. Among the pressures are human activities in the energy, transport, industry, and agricultural sector on natural resources (air, water, soil, organisms) to which the state, society, business, and international actors respond. Between these three elements of the PSR model there are many complex interactions (resource transfers, information, decisions).36

The UN Commission for Sustainable Development (UN-CSD) used with its DSR (Driving Force-
State-Response) model a slightly modified framework.37 The European Environment Agency (EEA 1998) has developed a framework that distinguishes “Driving Force – Pressure – State – Impact – Response (DPSIR)”38 that offers a mechanism for the analysis of environmental problems and for the development of environmental indicators.39

A different model was used as a framework for the Millennium Ecosystem Assessment (MA 2003, 2005; Leemans 2009). It distinguished between direct and indirect drivers of change that directly affect human well-being and ecosystem services. In this framework, besides the material minimum for a good life, health, and good social relations, security is considered as one of the key elements of human well-being that influence freedom of choice. Security has been defined as: a) the ability to live in an environmentally clean and safe shelter, and b) the ability to reduce vulnerability to ecological shocks and stress (MA 2005; Leemans 2009). These four models were used to develop environmental indicators and to guide ecosystem assessment. But they did not focus on the linkages between processes of climate change and natural hazards and their sociopolitical consequences.

The Pressure-Effects-Impacts-Societal Outcomes-Response (PEISOR) model was stimulated by these pressure and response models and by the debates on environmental security (Homer-Dixon/Deligiannis 2009; Mason/Hagmann/Bichsel et al. 2009) and on natural hazards. The PEISOR model (Brauch 2009; Brauch/Oswald Spring 2009; chap. 17 by Oswald Spring; chap. 37 by Brauch) combines five stages:

- **P (pressure)** refers to six or eight drivers of global environmental change (survival hexagon or ‘octagon’);
- **E to the effects** of the linear, non-linear, or chaotic interactions within the ‘hexagon’ on environmental scarcity, degradation, and stress;
- **I to extreme or fatal impacts** of human-induced and climate-related natural hazards (storms, flash floods, flooding, landslides, drought);
- **O to societal outcomes**: internal displacement, migration, urbanization, crises, conflicts, state failure, and
- **R to response** by society, the business community, and the state, where both traditional and modern technological knowledge can make a difference.

While hazards cannot be prevented, their impact in terms of deaths, affected people, and economic and insured damages can be reduced by a combination of policies and measures that link protection with empowerment of the people to enable them to become more resilient. Figures 17.6 and 37.3 refer in the first column under causes or pressure to six or eight key factors contributing to GEC, three supply or environmental factors (land, air, water, and biodiversity) and three demand or human factors (population living and working in rural or urban systems and socioeconomic systems). These six or eight factors interact in a non-linear or sometimes chaotic way, and impose pressure on the political and societal context, where they may trigger, impact, or affect socio-economic interactions, either causing or contributing to anthropogenic environmental degradation (of water, soil, air) or scarcity (of water and soil). The interaction between these two processes may result in environmental stress that can have various extreme and even fatal impacts.

However, there may also be a direct impact of climate change resulting in an increase in hydro-meteorological hazards. This aspect has hardly been addressed in the initial environmental security research (Dalby/Brauch/Oswald Spring 2009) but it is key to the debate on the securitization of climate change. Environmental stress may increase the impact of hazards (for the highly socially vulnerable) and cause or contribute (with natural hazards and conflicts) to internal displacement, to urbanization, and to trans-boundary forced migration.

Whether these factors result in domestic crises, disasters, or (in a few worst cases) violent conflicts, or whether these can be avoided, depends on many specific factors and activities resulting from the interaction between the three actors representing the state, society, and the business community. It also depends on the use of both traditional and modern technical and organizational knowledge and knowledge-based response strategies by governments and international organizations and transnational societal and economic organizations.

As discussed below by Scheffran, Link, and Schilling (chap. 5), there are various possible pathways between climate change and conflict that are influ-

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37 UN Commission for Sustainable Development: “Indicators of Sustainable Development”, at: <http://www.un.org/esa/sustdev/isd.htm>.
38 Jochen Jesinghaus: “European System of Environmental Pressure Indices”, at: <http://esl.jrc.it/enwind/theory/handb_o3.htm>.
39 European Commission: “Towards Environmental Pressure Indicators for the EU”, at: <http://www.e-m-a-i-l.nu/tepi/firstpub.htm>.
Changes in the climate system, such as increases in greenhouse gas concentrations, temperature, and precipitation, affect environmental systems and natural resources (e.g., soil, water, ecosystems, forests, biodiversity) through a sequence of complex interactions.

1. Changes in the climate system, such as increases in greenhouse gas concentrations, temperature, and precipitation, affect environmental systems and natural resources (e.g., soil, water, ecosystems, forests, biodiversity) through a sequence of complex interactions.

2. Changes in natural resources can have adverse impacts on human values and capabilities, which may provoke human responses that can affect social systems.

3. Depending on the degree of vulnerability, socioeconomic stress increases as a result of water and food insecurity, health problems, migration, economic degradation, the weakening of institutions, diminishing economic growth, and eroding societies.

4. Interdependencies between these factors may lead to societal instability that can manifest itself in violent forms such as riots, insurgencies, urban violence, or armed conflict.

5. A feedback loop allows human beings and societies to adapt to the changing situation and mitigate climate stress through strategies, institutions, and governance mechanisms that may apply technology or human and social capital to adjust the economy and the energy system to the altered environmental conditions.

The significance of the impacts of climate change on society and security can be deduced from the links between the variables and how events spread along the causal chain or cascade, which is a function of the sensitivities between variables. Kominek and Schefranski (2011) have discussed for two examples from early 2010 different ‘cascading processes’. While the Japanese earthquake, tsunami, and nuclear catastrophe triggered a delegitimization of nuclear energy, the many natural hazards in Russia, Ukraine, Canada, and Australia were instrumental in the rapid increase in the global food crisis, which may have been one of several causes for the ‘Arabellion’ that triggered a series of incidents of public unrest throughout the Arab world (chap. 37 by Brauch).

1.5 Structure of the Book

1.5.1 Focus of the Nine Parts

The book is divided in nine parts. After this introduction, in part II five chapters (chap. 2–6) deal with “Climate Change, Human Security, Societal Stability, and Violent Conflict: Empirical and Theoretical Linkages”, while in part III eight chapters (chap. 7–14) discuss “Climate Change and the Securitization Discourse” and in part IV four conceptual and empirical chapters (chap. 15–18) examine the linkages between “Climate Change and Migration”. The next three parts offer regional case studies focusing in part V in four chapters (chap. 19–22) on “Climate Change and Security in the Middle East”, in part VI in five chapters (chap. 23–27) on “Climate Change and Security in Africa”, and in part VII in five chapters (chap. 28–32) on “Climate Change and Security in Asia and the Pacific”. In part VIII five chapters (chap. 33–37) address cross-cutting issues on “Improving Climate Security: Cooperative Policies and Capacity-Building” and in part IX (chap. 38) the five co-editors summarize the results in “Conclusions and Outlook”.

1.5.2 Climate Change, Human Security, Societal Stability, and Violent Conflict: Empirical and Theoretical Linkages

In part II the first two chapters offer two different theoretical and quantitatively oriented perspectives on the linkages between climate change and armed conflict (chap. 2) and on climate change and societal stability (chap. 3). This is followed by a policy-oriented assessment on “Climate Change, Conflict, and Fragility” (chap. 4) and two chapters by the CLISEC Research Group on “Theories and Models of Climate-Security Interaction: Framework and Application to a Climate Hot Spot in North Africa” (chap. 5) and on “Global Climate Policy Reinforces Local Social Path-Dependent Structures: More Conflict in the World?” (chap. 6).

40 The brief summary of the research questions and the structure of the chapters are based in part verbatim on the introductory section of the individual chapters in order to reflect their focus as closely as possible.
In chapter 2, Halvard Buhaug and Ole Magnus Theisen (both from the Peace Research Institute Oslo (PRIO), Norway) review, from a political science perspective, the theoretical foundation for the central arguments linking climate change to armed conflict, assess the quantitative literature on the subject matter, point to discrepancies in findings and interpretations, and provide an empirical assessment of drought and civil war in sub-Saharan Africa since 1960.

In chapter 3, Peter F. Nardulli and Kalev H. Leetaru (both Cline Center for Democracy, University of Illinois, USA) introduce the Societal Infrastructures and Development (SID) project and its scope and relevance for research into the societal effects of climate change, with a special focus on the Social, Political, and Economic Event Database (SPEED) project, which generates data on small-bore civil unrest events that are temporally and spatially referenced. It illustrates how SPEED data can be used to provide succinct insights into societal stability, and it describes how SID and SPEED data can be used in different research designs to examine the destabilizing effects of climate change.

In chapter 4, Dan Smith and Janani Vivekananda (both International Alert, UK) conclude, given the uncertainties surrounding the impact of climate change and the related political contestation, and the complex environment in which impacts must be addressed, that the most productive path of inquiry is to focus on resilience, the capacity of a system to withstand shocks and to rebuild and respond to change – including unanticipated change.

In chapter 5, Jürgen Scheffran, Michael Link, and Janpeter Schilling (all Research Group Climate Change and Security (CLISEC), KlimaCampus and Institute of Geography; University of Hamburg, Germany) address “Theories and Models of Climate-Security Interaction: Framework and Application to a Climate Hot Spot in North Africa”. As a systematic and integrated assessment of the climate-security link is still lacking, the authors argue that there is a need to design interdisciplinary and theoretical approaches to improve the understanding of how actors adapt to climate change and whether potential security implications can be avoided. In this chapter theoretical approaches and modelling tools are presented for analysing the complex relationships, and an integrated assessment framework is introduced for examining the causal chain between climate change, natural resources, human security, and societal stability in order to provide a deeper understanding of the links between climate and security links and their potential for inducing destabilizing effects, affecting tipping points, and triggering conflicts.

In chapter 6, Jasmin Kominek (CLISEC Research Group and Institute of Sociology, University of Hamburg, Germany) argues that “Global Climate Policy Reinforces Local Social Path-Dependent Structures”, and asks whether this will result in more conflict in the world. Based on the different steps in a problem-solving process, a formal scheme is presented that distinguishes between the overall problem-solving process, situational analysis, modelling and evolving strategies, and situational intervention. Using this structure, in each section each step is explained in greater detail and the theoretical background is presented, expanded, and developed.

1.5.3 Climate Change and the Securitization Discourse

In part III, eight political scientists (chap. 7–13) provide theoretical perspectives on the evolving discourse on the ‘securitization’ (Waever 1995, 1997, 2008) of climate change. Maria J. Trombetta (Delft University of Technology, The Netherlands, from Italy) reviews in chapter 7 the “Climate Change and the Environmental Conflict Discourse” and provides a genealogy of environmental conflict, outlines how this discourse has been challenged, illustrates the recent debate on climate change and conflicts, and offers an account of the contemporary dynamics of the security field with respect to a double process of securitization of global governance and governmentalization of global security.

In chapter 8 on “Climate Change as a Driver of Security Policy”, Michael Brzoska (Institute for Peace Research and Security Policy; Political Science, University of Hamburg, Germany) argues that climate change has become a top item on the security agenda of many states and international organizations, but that there is no consensus that climate change is a security threat, nor agreement on what and who will be threatened by climate change. This chapter reviews selected national security strategies and defence planning documents, and asks whether climate change is seen as a security issue and what kind of security climate change is said to endanger. It focuses on the consequences that security elites have drawn from the framing of climate change as a security issue, and it discusses possible reasons for differences between various countries in their positions regarding the climate change and security nexus.
In chapter 9 Angela Oels (KlimaCampus, University of Hamburg, Germany) argues for moving "From Securitization of Climate Change to Climatization of the Security Field: Comparing Three Theoretical Perspectives". She asks what the articulation of climate change as a security issue means in terms of policy implications, how climate change is to be rendered governable as a security issue, and what the consequences of this are. To answer these questions, she introduces three theoretical perspectives: the Copenhagen School, the human security perspective, and the Paris School. They offer theoretical perspectives on what it means to render something governable as a security issue and whether or not this is desirable. The review of each analytical perspective concludes with an assessment of the strengths and weaknesses of the respective approach.

In chapter 10 on a “Critical Deconstruction of Environmental Security and Human Security Concepts in the Anthropocene”, Judith Nora Hardt (University of the Basque Country, Spain, from Germany and France) provides a critical understanding of security as a positive value that ensures basic needs with a normative transformative aspiration, and notes its understanding as a negative value linked to environmental conflict and the risk of militarization. The chapter elaborates a framework for analysis based on Critical Security Studies (CSS) for the Anthropocene; it discusses the concepts of environmental security and human security and points to the risks and weaknesses of the different versions of environmental security and of the human security approach in relation to GEC.

In chapter 11 Linda Wallbott (Johann Wolfgang Goethe-University, Frankfurt am Main, Germany) focuses on the “Political in Nature: The Conflict-fuelling Character of International Climate Change Policies between Paternalism and Hegemony”. The chapter analyses how the framing of climate change has changed over time, but also how the actual policies employed have safeguarded the hegemonic and paternalistic character of this policy field. It shows how environmental change defines problems and solutions at various political levels, elaborates the climate change/security nexus, develops three reasons for the implementation of context-sensitive adaptation policies, and traces the evolution of international climate change policies.

In chapter 12 on “Security as a Weapon: How Cataclysm Discourses Frame International Climate Negotiations”, Detlef Rothe (University of Hamburg, and Helmut Schmidt University, Hamburg, Germany) asks why the storyline of climate change as a security threat is so successful but does not lead to the political consequences that are assumed by the securitization framework. He draws on the insights of post-structuralist discourse theory to overcome the shortcomings of the Copenhagen School in a metaphor-based discourse analysis focusing on the negotiations of a post-Kyoto agreement, using 60 newspaper articles from major German print media and speeches by political actors in 2009.

In chapter 13 on “Audience: A Weak Link in the Securitization of the Environment?”, Tasos Karafoulidis (Organization of Vocational Training, Greece) addresses the reasons for the failure of the securitization of climate change. Focusing on the audience, he tries to explain the insufficient securitization of climate change. He develops a theoretical prism for the analysis, outlining the reasons why the securitization approach is useful and may be applied to climate change. He stresses the role of the audience and discusses how ‘securitizing actors’ increase the persuasiveness of their ‘securitizing moves’ for the audience, and how these results explain the lack of securitization in relation to the audience’s role.

In chapter 14 on “Words, Visuals, and the Vanished Enemy: Visual Securitization and the COP15 Opening Film”, Tore Rørbek (Royal Danish Defence College, and University of Copenhagen) introduces ‘visual securitization’ theory as a way of comprehending the dynamics of securitization, using a film shown at the opening of COP 15. He focuses on climate change as a security issue, reviews the critique of securitization theory for ignoring modern communicative techniques, presents the categories of ‘immediacy, circularity, and ambiguity’ to distinguish an image from a text, and applies these to the analysis of a film.

1.5.4 Climate Change and Migration

In part IV, the authors of four chapters (chap. 15–18) analyse the links between climate change and human migration. These have resulted in, or will lead to, environmentally-forced migration or climate refugees, and this situation is instrumental in generating intensive efforts to justify new technologies and equipment for “Policing Borders in a Time of Rapid Climate Change”.

In chapter 15 on “Climate Change and Human Migration: Towards a Global Governance System to Protect Climate Refugees”, Frank Biemann (Department of Environmental Policy Analysis, VU University Amsterdam, The Netherlands/Germany) and Ingrid...
Boas (University of Kent, UK) analyse the current global governance of refugees and provide a blueprint for a global governance architecture for the recognition, protection, and voluntary resettlement of climate refugees, before reflecting on the political constraints that these proposals are likely to face, and drawing their conclusions. They believe that the protection of climate refugees requires an effective system of multilevel governance, with a strong global framework providing vital support for, and coordination of, national and local efforts.

In chapter 16 on “Climate Refugees’ as Dawning Catastrophe? A Critique of the Dominant Quest for Numbers”, Cord Jakobeit and Chris Methmann (both with the chair of International Politics, University of Hamburg, Germany) survey the research on the climate-migration-nexus, and argue that existing approaches are fundamentally flawed in projecting future numbers of climate refugees. They claim that the maximalist quest for numbers stretches the predictive capacity of the social sciences beyond its limits, and they propose to turn to better understanding the link between climate change and flight and migration, using detailed and thorough case studies that allow for reconstructing the complex causal mechanisms, thus emphasizing the need to understand a complex phenomenon before making predictions.

In chapter 17 on “Environmentally-Forced Migration in Rural Areas: Security Risks and Threats in Mexico”, Úrsula Oswald Spring (National University of Mexico (UNAM), Regional Multidisciplinary Research Center (CRIM), Mexico) deals with international migration and its geopolitical repercussions between Mexico and the USA, arguing that different sociopolitical conditions may pose human, environmental, water, soil, food, and health security risks for both countries. She analyses environmentally-forced migration from rural areas in Mexico to towns and to the USA and Canada, develops the theme of environmentally-forced migration, and outlines the specific sociopolitical context for Mexico based on the PEISOR model in the framework of its five consecutive stages.

In chapter 18 on “Policing Borders in a Time of Rapid Climate Change”, Steve Wright (Praxis Centre, Leeds Metropolitan University, UK) argues that the process of securitization is already under way due to concerns about internal state security and international terrorism. His central thesis is that a new arsenal of technologies of political control has evolved and that these weapons together with new military doctrines will result in their active deployment against civilians in new public order roles, including negative human responses to climate change. He explores the risks posed by enhanced border control and crowd control initiatives, together with the massive funding for future security technology innovations provided in the wake of 9/11. He discusses these developments and ethical areas, and highlights some of the complicated moral, legal, and ethical factors. He concludes with several policy suggestions, including the potential role of ‘research activism’.

1.5.5 Climate Change and Security in the Middle East

In part V, four chapters (chap. 19–22) examine the linkage between climate change and security in the Middle East. In chapter 19 on “Climate Change on the Arabian Peninsula – Regional Security, Sustainability Strategies, and Research Needs”, Dennis Kumetat (London School of Economics and Political Science, UK) sketches the potential implications of climate change for the Gulf countries, and links it to the changing security dynamics of the region. After an analysis of Yemen, the sustainability strategies of some Gulf States are examined. The chapter offers a policy brief on the impact of climate change in the Gulf and identifies fields for future research.

Chapter 20 by Andy Spiess (Gulf Cooperation Council Network for Drylands Research and Development, Germany) on “Environmental Degradation, Climate Uncertainties, and Human Vulnerabilities: Toward a Shifting Security Paradigm in the Arab Gulf Monarchies” addresses the multiple effects that environmental degradation, resource depletion, and climate uncertainties will have on future human security in the region, and outlines the Gulf countries’ limited adaptation capacities. A comparison of the cases of Saudi Arabia, Bahrain, and the United Arab Emirates (UAE) illustrates differences and shows that each Gulf country must be assessed separately. While the Arab oil monarchies urgently need to include these new threats in their regional security discourse, their range of possible actions may already be trapped in a vicious circle.

In chapter 21 on “Altering Security Dynamics? Climate Change Impacts on Iraq”, Achim Maas and Kerstin Fritzche (both adelphi, Berlin, Germany) offer an analytical framework for analysing how climate change may lead to insecurity, violent conflict, and political fragility. In this way they are able to create synergies between existing approaches. They provide a brief overview of the main concepts and approaches
to climate change and security, apply the Regional Security Complex Theory by Buzan and Wæver to the case of Iraq, and show how climate change could induce (further) instability there and in the neighbouring countries. Iraq was chosen for its political relevance and as a downstream country that most likely will be negatively impacted by climate change. They focus on violent or armed conflict from a non-traditional approach to security.

In chapter 22 on “Reality and Discourses of Climate Change in the Israeli-Palestinian Conflict”, Clemens Messerschmid (Universities of Göttingen and Freiburg, Germany) examines climate change implications in the Middle East for Israel and the occupied Palestinian territories in their respective discourse and in particular with respect to the sociopolitical consequences for the water conflict. He discusses how the climate change (CC) discourse can be instrumentalized for non-scientific hydrostrategic agendas and he argues that CC is successfully employed to excuse the injustice in water relations under the Israeli occupation. The critical CC discourse analysis is juxtaposed with the conflict. The solutions proposed for adaptation and mitigation are discussed for the respective discourses on cooperation.

1.5.6 Climate Change and Security in Africa

In part VI, five chapters (chap. 23–27) map climate insecurity in Africa, address the resource competition and conflict amongst pastoral communities in Kenya, review possible linkages between climate change and violent conflicts in Nigeria, discuss efforts to enhance security and resilience of low-income communities in Kampala, and assess malnutrition and conflict in East Africa by pointing to the impacts of resource variability on human security.

In chapter 23 on “Locating Climate Insecurity: Where Are the Most Vulnerable Places in Africa?”, Joshua W. Busby (LBJ School of Public Affairs; Robert S. Strauss Center for International Security and Law, University of Texas at Austin, USA), Todd G. Smith (LBJ School of Public Affairs), Kalba L. White (Climate Change and African Political Stability (CCAPS) Programme, Robert S. Strauss Center for International Security and Law), and Shawn M. Strange (Sustainability Education and Economic Development (SEED) Center, LBJ School of Public Affairs) argue that Africa is most vulnerable to climate change with severe physical effects due to the low adaptive capacity of many African states. This chapter opens with a discussion of vulnerability and includes a review of several examples of vulnerability indices, it presents an overview of the approach of the authors to vulnerability and a detailed review of the methodology, and it presents the findings and several maps of areas of particular concern.

In chapter 24 on “Climate Change, Resource Competition, and Conflict amongst Pastoral Communities in Kenya”, Beth Njeri Njiru (Kenyatta University, School of Environmental Studies in Nairobi, Kenya) argues that violent conflicts involving pastoralists are associated with resource competition aggravated by climate change. Conflicts among the pastoral communities have become very common and increasingly relentless in the northern region of Kenya. The study documents the evidence of climate change in the pastoral areas of Kenya, determines its effects on pastoralist livelihoods, and discusses its effects on resource-based conflicts among pastoral communities. Primary data was obtained from pastoralists, agro-pastoralists and key informants, and four focus group discussions were conducted on how climate change has affected pastoralism. She concludes that resource competition among the pastoralists has resulted in conflict.

In chapter 25 on “Climate Change and Violent Conflicts in Nigeria: Human Needs and Relative Deprivation Theories”, Oscar Edoror Ubhenin (Ambrose Alli University, Ekpoma, Nigeria) discusses the major causal chains between climate change and violent conflicts and what theories are helpful for the analysis of the links between climate change and violent conflicts in Nigeria. Two theories, namely ‘human needs’ and ‘relative deprivation’, provide a framework for explaining the causal link between climate change and violent conflict. The first theory argues that a root cause of conflict is the failure to satisfy universal human needs. The relative deprivation theory explains the gap between people’s expectations and reality, between what their life ‘is’ and what their life ‘ought to be’. Based on the literature, he analyses the Niger Delta conflict and the Boko Haram uprising, and identifies the prospects for addressing climate security challenges for Nigeria.

In chapter 26 on “Enhancing Security and Resilience of Low-Income Communities to Climate Change in Growing Cities: An Assessment of Flood Management and Planning Regimes in Kampala City Uganda”, Paul Isolo Mukwaya (Department of Geography, Geo-informatics and Climatic Sciences, Makerere University, Kampala, Uganda), Hammington Senzendo (Department of Architecture and Physical Planning, Makerere University), and Shuaib Luasa
(Department of Environmental Management, Makerere University) assess the influence of flood management and planning regimes in enhancing the resilience and security of these low-income settlements.

In chapter 27 Pedram Rowhani (Department of Geography, University of Sussex, Brighton, UK, from Luxembourg), Olivier Degomme (Ghent University and University of Louvain, Belgium), Debarati Guha-Sapir (Centre for Research on the Epidemiology of Disasters (CRED), University of Louvain, Research Institute Health and Society, Brussels, Belgium, from India), and Eric F. Lambin (Department of Geography, University of Louvain, Belgium; Woods Institute for the Environment, Stanford University, USA, from Belgium) deal with “Malnutrition and Conflict in East Africa: the Impacts of Resource Variability on Human Security”. They present a study of the geographical distribution of malnutrition and armed conflicts in eastern Africa (Sudan, Ethiopia, Somalia), where droughts, floods, famines, and violence have prevailed for decades. They offer a statistical investigation into whether there is a regional-scale association between spatio-temporal variations in ecosystem attributes and the occurrence of malnutrition and conflicts, while controlling for other important factors. Contrary to a widely-held view, they suggest a positive association between ecosystem productivity and conflicts. Their analysis does not show any association between short-term land degradation and either conflicts or malnutrition.

1.5.7 Climate Change and Security in Asia and the Pacific

In part VII, in five chapters ten authors offer case studies on Bangladesh, India, and Indonesia, and on the challenge posed by climate change for sovereignty, with a focus on the Pacific.

In chapter 28 on “Climate Awareness and Adaptation Efficacy for Livelihood Security against Sea Level Rise in Coastal Bangladesh”, Md. Mustafa Saroar (Urban and Rural Planning, Khulna University, Bangladesh) and Jayant K. Routray (Regional and Rural Development Planning; Disaster Preparedness, Mitigation, and Management, Asian Institute of Technology, Bangkok, from India) analyse the influence of climate awareness on coastal people’s adaptation efficacy against the impacts of climate change and sea level rise (CC-SLR) on their livelihood security. They focus on the coastal community in Bangladesh who are most susceptible to SLR. They assess the coastal people’s relative awareness of climate change through the perception of CC-SLR-related events, familiarity with climate change and extreme weather signals, and tacit or intuitive knowledge about the impacts of future SLR. Three indices, a ‘perception index’, a ‘familiarity index’, and a ‘knowledge index’, as proxy indicators of climate awareness, are introduced and subsequently constructed.

In chapter 29 on “Security Implications of Climate Refugees in Urban Slums: A Case Study from Dhaka, Bangladesh”, Sujan Saha (consultant from Bangladesh who lives in Denmark) asks whether climate refugees are a threat to peace and security. He offers an empirical examination of the climate-induced instability thesis using a micro-level analysis of the security implications of climate change. This is based on a survey of individuals who have migrated from the slums of Dhaka, and examines the role of the interactions between migrants and groups in leading to violent conflicts at the micro level.

In chapter 30 on “A Psychological Perspective on Climate Stress in Coastal India”, Ruchi Mudaliar and Parul Rishi (both Indian Institute of Forest Management, Bhopal, India) offer a pilot study of a coastal site in India and develop a conceptual framework for the behavioural analysis of people in the context of climate change and how they have adapted to it. If global climate change is anthropogenic, then the solutions are also rooted in human behaviour.

In chapter 31 Mohammad Zulfan Tadoeddin (University of Western Sydney, Australia, from Indonesia), Anis Chowdhury (University of Western Sydney; and Department of Economic and Social Affairs of the United Nations (UN-DESA), New York, from Australia/Bangladesh), and Syed Mansoob Mursheed (Institute of Social Studies (ISS), The Netherlands; and Birmingham Business School, University of Birmingham, UK, from Bangladesh) examine “Routine Violence in Java, Indonesia: Neo-Malthusian and Social Justice Perspectives”. They analyse the role of population pressure and inequality and their possible joint effects on routine violence in Java by looking at violence from the perspectives of neo-Malthusianism and social justice. They empirically scrutinize these two determinants of violent conflict, and their possible joint effects on routine, everyday violence in the ethnically rather homogenous and densely populated Java. They review past research on violent conflict in Indonesia and discuss the framework of analysis of routine violence that is linked to population pressure and inequality. They explain their model and data issues and present the results, and some conclusions.
1.5.8 Improving Climate Security: Cooperative Policies and Capacity-Building

In part VIII, in five chapters (chap. 33–37) seven authors address cooperative policies for the climate change-security nexus by reviewing the political debate on securitization at the UN, considering climate change in the context of peacekeeping and UN reform, the relevance of the forestry aspects (REDD) in the context of international climate change policies, and presenting an extensive case study discussing possible responses to climate change impacts but also economic opportunities in the Mediterranean and the MENA region. One chapter looks into the role of information systems in improving resilience and security.

In chapter 33 Gerrit Kurtz (University of Potsdam, Germany) examines the “Securitization of Climate Change in the United Nations 2007–2010” using an interpretative analysis, based on discourse theory, of the speeches by representatives of UN member states as well as surrounding documents. The theoretical framework relies on the securitization theory of the Copenhagen School and on the ‘sociological’ approach of the Paris School, and includes the concerns of Critical Security Studies. After a discussion of the theoretical and methodical framework of a revised securitization theory, the empirical part identifies discourse coalitions in the UN debates based on a common understanding of security. The author offers a functional analysis of the discursive tools employed by the speakers and their combination with certain frames, narratives, and storylines. He then discusses the results of these analyses by placing them in their explicit institutional and temporal context, and tries to answer the questions of why climate change is securitized in the United Nations and what the corresponding policy implications are that can be discerned from the actors’ discourse strategies.

In chapter 34 Bo Kjellén (Stockholm Environment Institute (SEI); Uppsala, Sweden) and Peter Wallensteen (Dag Hammarskjöld Professor of Peace and Conflict Research, Uppsala University; and University of Notre Dame, Indiana, USA) discuss linkages between “Climate Change, Peacekeeping, and Perspectives for UN Reform”. They note that the security concerns of nations are changing: whereas traditional security policy has been crafted to face threats from other nations or coalitions of nations, the Anthropocene has created a new kind of threat as we cannot negotiate with climate change. They call for a new diplomacy for sustainable development and assess the role of the UN Framework Convention on Climate Change (UNFCCC).

In chapter 35 on “International Climate Change Policies: The Potential Relevance of REDD+ For Peace and Stability”, Dennis Tänzler (adelphi, Berlin, Germany) and Felix Ries (German social anthropologist who works in Fiji) address the lack of reflection on the linkages between climate change impacts and peacebuilding by analysing a key aspect of the mitigation debate, namely reducing deforestation, and how this may impact on potential (post-)conflict constellations. To this end, the major linkages between the relevant security implications of climate change and the major challenges for peacebuilding are outlined, and the potential of policies aimed at mitigating climate change through the reduction of deforestation in the context of the (de-)stabilization of conflict-prone areas are discussed. The chances and risks associated with these policies are explored, along with the conditions under which they are likely to achieve their goals through the strengthening of capacities and sound engagement with the international climate change process.

In chapter 36 on “The Role of Information Systems in Improving Resilience and Security through Innovation-Oriented Capacity Building”, Tagelsir Mohamed Gasmelseid (King Faisal University, Al Ahsaa, Saudi Arabia, from Sudan) presents the concept of capacity development in urban water management, with an emphasis on the challenges and limitations. He addresses its conceptualization in the context of sustain-
able innovations in urban water management, and reflects on information systems in this context.

In chapter 37 Hans Günter Brauch (Free University of Berlin; and editor, Hexagon Book Series, Mosbach, Germany) discusses “Policy Responses to Climate Change in the Mediterranean and in the Middle East and North Africa in the Anthropocene”. He starts with a discussion of the geographic focus and of the PEISOR model for the analysis of interactions between nature and human systems, and notes the gap between the projected impact of global climate change and the insufficient political awareness, diagnosis, and policy implementation. He then presents possible policy responses, as strategies, policies, and measures to address climate change in the MENA region, using projections to 2030, 2050, and 2100. The chapter discusses the need for improving the knowledge base by research that relies on a required fundamental change to scientific paradigms, to the worldviews of scientists, and to the mindsets of policymakers. This change is needed to cope with the projected multiple security challenges in either a ‘reactive’ or a ‘proactive’ mode. Although the study is based in the social and policy sciences, relying on qualitative-sociological methods and approaches used in the research programmes of peace, security, and environmental studies, its goal is multidisciplinary, and it offers a regional case study illustrating the need for a ‘fourth sustainability revolution’ in the framework of the suggested new ‘political geo-ecology for the Anthropocene’.

1.5.9 Conclusions and Outlook

In part IX in chapter 38 the five co-editors, Jürgen Scheffran, Michael Brzoska, Hans Günter Brauch, Peter Michael Link, and Janpeter Schilling, summarize the theoretical and empirical results of the contributions, and try to place the results from this book within the framework of emerging international scientific research on the climate change and security nexus, as well as work at Hamburg University, including that in the framework of the CliSAP cluster of excellence and the research programme of the CLISEC Research Group.

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