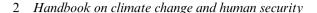# Introduction: human security in the age of carbon
Michael R. Redclift and Marco Grasso

Throughout human history individuals and societies have been threatened by environmental change. Nowadays these risks are magnified: there is, in fact, widespread evidence that climate change is increasingly bringing about dramatic impacts on natural and social systems (IPCC 2007) and is seriously endangering the human security of most of the world's population. (Part III of this Handbook examines the repercussions of climate change for human security in some of the world's most sensitive regions). The earth sciences make it clear that we are in the *Anthropocene* (Crutzen 2002) and that humankind is living in the age of climate change, a global and complex phenomenon that could undermine the stability of natural and social systems and ultimately affect human security (see Scheffran and Remling, this volume). Therefore, in introducing this Handbook, we first need to briefly situate both historically and culturally the relationship between human security and climate change.

The background to the discussion of human security and climate change is provided by earlier debates in which it was suggested we were reaching the limits of resource capacity. During the 1970s resource shortages were seen as a constraint on further economic growth and development. The argument for resource conservation was thus that by conserving resources we were able to facilitate economic growth, subject to natural limits. This was essentially the 'Limits to Growth' position in the early 1970s (Meadows 1972). At the same time existing levels of economic growth were seen as representing a threat to the environment and resources. It was argued that a vicious circle had been created in which economic activity undermined the biosphere resources on which we rely.

The first position – that resource conservation assists necessary economic growth – lost support partly because it was a product of high-energy prices (the oil hikes of the 1970s). As hydrocarbons became relatively cheaper, and the effects of the Green Revolution in expanding food staples to meet population growth began to be acknowledged, it was also clear that the Malthusian position no longer held – that population increased to exceed the resources necessary to feed this growth. And the drive for economic development in the South (circa the Brandt Commission report

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of 1980) was overtaken by events: at first it was put in jeopardy by the debt crises of the 1980s, the structural adjustment programmes, and post-recovery the deregulation of markets, the retreat of the state and, eventually, higher levels of economic growth in much of the newly developing world, especially the populous economies of Asia.

The genius of the position that came to be referred to as 'sustainable development' was that almost everybody could sign up to it. There were very few dissenting voices (Redclift 1987). The mechanisms which were unleashed via deregulation and the neoliberal ascendancy (the Washington Consensus – a 'consensus', incidentally, in which most people had not been consulted) became the favoured instruments of policy in seeking to achieve sustainable development. These took two forms.

First, attempts to internalize environmental externalities in products and services – or 'ecological modernization'. This was viewed as a competitive strategy by the European Union, in particular, giving Europe a competitive advantage over the United States and any newly developing rivals. Basically, you count the embodied carbon in products, seek to reduce energy and material throughput, and make a 'win/win' gain, by reducing energy costs (hydrocarbons prices were rising) and reducing environmental damage. Trade arrangements also take account of 'embodied carbon'. The more interventionist policies of the European Union facilitated this in the 1990s.

Second, changes occurred with the development of carbon markets, both within industries and, more importantly, between countries. These new markets represented a challenge for entrepreneurship, new market opportunities, and required very little government action. Carbon markets were thus popular among devotees of free-market economics and environmentalism, unlike other interventions such as carbon taxes. Several awkward questions were not posed, however. What might happen when markets fall and the price of carbon drops significantly? What were the wider implications of trading in a *bad* (pollution) rather than a *good*: in institutionalizing the idea of carbon dependency? This latent opposition to carbon trading as a solution remained largely inchoate in the rush to endorse it. Today, in 2013, it is undermined by policy intervention: the European Union issuing fewer carbon permits to ensure that their price rises, rather than falls.

The conversion of governments to a more or less uncritical view of markets was even more evident in the international efforts to 'protect' biodiversity. The biodiversity regime was expressed in the Convention on Biological Diversity (1992) and the Cartagena Protocol on Biosafety (2000). This demonstrated a shift from a focus on the loss of species diversity, and thus the loss of complex ecosystems, to a focus on the

preservation of genetic diversity, where the principal gains were in the pharmaceutical industries and agriculture (Paterson 2009). Again the almost imperceptible shift was from nature conservation to nature as commodity. The main opposition to the latter was from groups – mainly *non-governmental organizations* (NGOs) – which argued that marginalized people had rights in nature, which governments and the pharmaceutical industry ignored. However the industry lobby won much of the ideological struggle, insisting that *ex situ* conservation in gene banks should be treated as equivalent to *in situ* conservation in ecosystems.

Finally, the conjunction of newly liberated markets and environmental concern (a necessary contradiction of capitalism seeking a resolution) can with hindsight be seen as a managed senescence, if we continue with the biological metaphors of development.[1] A more mainstream view, however, would be that they addressed system failures, and could even lead to a rejuvenated, if scarcely recognizable, type of materials light capitalism (Lovins et al. 2000).

The hopes that markets and technology would solve the environmental problems associated with accelerated economic growth and the enormous rise in global consumption and carbon emissions were about to be challenged by events.
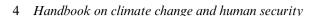
The financial crisis was fed by the personal greed of many bankers and financial managers, and fuelled by the virtually unregulated production of credit – not because interest rates were low, but because the price attached to housing equity (especially in the United States, the United Kingdom, Spain and Ireland) was unrealistically high. The rise in sub-prime lending and borrowing took place under systems of ineffective governance which emphasized everybody's right to property regardless of collateral and debt levels. Politically it was sold as everybody's right to credit rather than their right to debt. The financial crisis revealed that it was completely unsustainable.

While the policy response paid lip service to the rapidly disappearing Green agenda, it did not support this rhetoric with effective interventions (cf. the almost derisory role of new Green investment in attempts to address the financial crisis). There was now considerable evidence of the effects of the financial downturn on migration, as well as poverty, notably in China, which supported the United States' debt through buying in to its financial packages, and supported raised consumption in the West generally, by lowering the costs of manufactured goods there.

Another process that has gathered speed is that of transnational sourcing of food, minerals and other resources. The internationalization of capital movements and the need to secure resources has led to increased transnational acquisition of land and minerals, on the part of China and some

of the Gulf States, principally in Africa. Rather than depend exclusively upon trade relations to meet their domestic resource deficiencies – trade contracts during an economic recession – the advantages of acquisition of land, water sources, food (via virtual water) became evident, especially for their geopolitical reach. Land displacement for crops like soya had already changed international food/land imbalances.

This brief exegesis on the political and economic context of the 'carbon age' suggests that market-based and fossil fuel-centred socio-economic systems, by triggering global climate change, are seriously threatening our planet, together with other forms of resource degradation. At the same time human societies and their environments are bound together in sets of complex relationships in which carbon use and dependence form a central dimension. The financial crisis and austerity measures in much of Europe and North America only underline the fragility and co-dependence of human societies and nature. We argue that the concept of human security is the key entry-point for disentangling the entrenched and multi-layered connections between the carbon age and natural and socio-economic systems, and the ambivalent relationship with climate change.

SCOPE AND AIMS OF THE HANDBOOK

The clarification of the relationships between climate change and human security is extremely important in moving from the *carbon age*, of heavy dependence on hydrocarbons, to a much needed greener global economy. However, beyond the obvious claims of major threats of large-scale disruption to natural and social systems brought about by climate change, the interaction of climate change with human security is not easy to establish (Dalby, this volume). This is due in part to the uncertainty of the dangers posed by climate change, and in part to the still controversial and somewhat blurred notion of human security in the context of, and in connection with, climate change. The general aim of the Handbook is to shed light, at different levels and according to diverse perspectives, on the second issue: the complex and multifarious web of connections between human security and climate change. The primary feature of human security is its focus on the core values of human societies and their continuity over time. This is also the main difference from the traditional concept of security, which, on the contrary, is based on the use of force to prevent threats to autonomy and territorial integrity.

Although the perspective of human security first arose in the 1960s as a response to growing dissatisfaction with the traditional paradigms of security and development, it imposed itself in a structured way only in
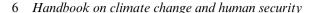
the early 1990s through the efforts of the United Nations Development Program (UNDP). The 1994 UNDP Report on Human Security stressed the essential properties of the notion of human security: the centrality of people, universality, the interdependency of its components, and its preventive sight, distinguishing seven areas of global concern: economic, food, health, environmental, personal, community and political. Furthermore, the report put forward a two-tiered definition of the concept of human security: '[i]t means, first, safety from such chronic threats as hunger, disease and repression. And second, it means protection from sudden and hurtful disruptions in the patterns of daily life' (UNDP 1994: 23). The UNDP report, which became the constitutive moment for the concept, identified seven areas of global concern: economic, food, health, environmental, personal, community and political.

There are in fact many possible definitions of human security put forward by the United Nations (UN) and other bodies of the UN system, by governments and by the academic literature. Despite a certain vagueness and controversy surrounding the boundaries, the notion of human security is almost unanimously agreed to concern both needs and rights, to include both individuals and communities, and to prioritize them, to integrate different drivers, and to demonstrate a concern for justice. Furthermore it is generally held that human security depends on a set of interlinked factors (e.g. political freedom, entitlements, economic equality) among which climate change might not be necessarily the most relevant one (Simon this volume; Scheffran and Remling this volume). For example, human security can be threatened by global processes acting independently but synergistically, e.g. global environmental change and globalization (Oswald Spring et al., this volume). Moreover, in general, it is recognized that human security is linked to both environmental and societal change, which are themselves mediated by the ecological/geographical and political/institutional context, distribution of rights and resources (Vanderheiden, this volume), and control over and access to assets (Bickerstaff and Hinton, this volume). The relative importance of such conditions and mediating factors, in turn depends on the characteristics of specific regions and communities.

Human security, in fact, is highly scale-dependent (Matthew, this volume) and it is most often observed at community or local level (Hall, this volume). As such, the very genesis of the concept of human security entailed a shift from states to individuals and communities (Gasper, this volume) although national states mediate in many ways in determining the conditions for human security (e.g. Nordås and Gleditsch, this volume; Mason, this volume). For example, many of the processes affecting human security in the Mediterranean region are occurring at national level

(e.g. the Arab Spring) and generate phenomena that call into question the role of national states themselves, for example in relation to immigration (Grasso and Feola, this volume).
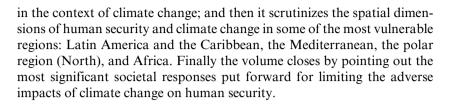
Although it is important to distinguish analytically among the different environmental and societal drivers of human security, it is also important to bear in mind that they are closely interlinked, and that threats to human security often arise from the interplay among these drivers in specific contexts (Dalby, this volume). The best example is anthropogenic climate change. In fact, as repeatedly made clear throughout this volume, several environmental changes largely determined by climate dynamics interact with social and institutional ones, and they have the potential jointly to affect human security. Further, it is necessary to note that climate change, owing to its ramified and overarching impacts, can be seen as a threat multiplier (Matthew, this volume; Srinivasan and Watson, this volume) because of its many potential interactions with other factors of human insecurity. For example, climate change is believed to be linked with violent conflict, although the evidence is ambivalent, given that several studies do not find confirmation of such a link (Nordås and Gleditsch, this volume). Climate change is also linked with migration (e.g. Nuttall, this volume), whereby migration often results from a closely intertwined set of factors, among which are also demographic (e.g. overpopulation), economic (e.g. unemployment), and political (e.g. conflict, lack of human rights and freedom) ones (Ribot, this volume).

In general, the prospects for human security under climate change are strongly shaped by the interplay of local and global environmental, socio-economic and political-institutional processes (Webersik and Klose, this volume). Therefore, as we have argued, the broad objective of the current volume is to understand the complex interactions of these societal processes with human security and climate change and the different scales, issues and locations involved. This Handbook brings together the insightful perspectives of prominent scholars, who first explore the bidirectional relationships between climate change and human security, analyse the determinants of human security in climate change, and conduct extensive scrutiny of critical regions, as well as investigate the societal responses to the challenges posed by climate change. It is intended for both academics and decision-makers in the field of human development, climate and development policy and global environmental policy/politics, and aims at bridging the divide between the different groups and domains of scholarship and public policy.

The volume is structured along four major areas. First it seeks to analyse and systematize the intertwined relationships between climate change and human security; further it investigates the determinants of human security

in the context of climate change; and then it scrutinizes the spatial dimensions of human security and climate change in some of the most vulnerable regions: Latin America and the Caribbean, the Mediterranean, the polar region (North), and Africa. Finally the volume closes by pointing out the most significant societal responses put forward for limiting the adverse impacts of climate change on human security.

OVERVIEW OF THE HANDBOOK

Part I, 'Framing the issue: climate change and human security', explores in depth the evolution of the notion of human security and the emergence of climate change as an issue of human security, and carries out a more detailed investigation of some key conceptual topics involved by human security and climate change. Since climate change remains also a matter of traditional security the focus later turns to this perspective. Finally, in preparing the ground for the remaining parts of the volume, Part I widens the scope of the analysis in order to define the processes involved with human security and their spatial and temporal scales in the context of climate change.

In chapter 1, 'Climate change as an issue of human security', Simon Dalby puts forward a broad conceptual analysis that sets the stage for the entire Handbook, covering much of the most controversial matters of human security and its relationships with climate change. In particular the author opens his chapter by illustrating the switch from a pure environmental security perspective to a more development-oriented one in dealing with climate change. Then he puts forward a history of the idea of security, overviews the extensions of the concept of security through the 1980s and early 1990s as summarized by Emma Rothschild, and explores the UNDP formulation of human security and that of the Commission on Human Security. Dalby goes on to emphasize that the connections between human security and climate change need both to understand people's vulnerability and the causes of such vulnerability, and to engage with the discussions of the international norms of the responsibility to protect which obligates states to protect their populations. In the same vein Dalby argues that human security in climate change, or climate security, besides freedom from want, freedom from fear, and the ability to live a dignified life, rests also on the freedom from hazard impacts and involves intra-generational and intergenerational arguments of justice. Finally the big question raised by Dalby concerns the origins of the authority to implement human security in rapidly changing times. Human security, in fact, challenges traditional assumptions about the
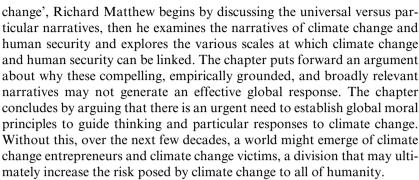
locus of political authority and makes it clear that a new political order is urgently needed.

In chapter 2, 'Elements and value-added of a human security approach in the study of climate change' Des Gasper analyses in depth some key-topics of human security in climate change. He first starts with a case, that of Bangladesh, and then analyses some features of human security discourse: (1) whose security? (2) security of what (which values/which sectors)? (3) provision by whom? (4) security as perceived by whom? (5) security against what threats? Gasper proceeds to discuss the application and potential value added of human security in the study of climate change. In particular, a human security approach can help in thinking about climate change by deepening consideration of connectivity and knock-on effects. Human security analysis can also contribute to an increasing sympathetic attention to the difficulties of others, through its consideration both of how 'distant others' live and feel and of the global interconnections. Finally, human security could support the changes that are needed for global sustainability, in respect of how people perceive shared vulnerabilities, shared interests, and shared humanity.

In chapter 3, 'The IPCC, human security, and the climate-conflict nexus' Ragnhild Nordås and Nils Petter Gleditsch define the IPCC as the leading agenda setter for debates about climate change and human security. Interestingly however, the IPCC assessment reports present climate change not only as a challenge to human security, but also in the narrower sense of armed conflict. Nordås and Gleditsch carefully review the Third (TAR) and the Fourth (4AR) Assessment Reports in order to point out how they have dealt with the climate-conflict nexus and to make clear the empirical basis for the claims made. In general they find, especially in the 4AR, that the tone used to relate climate change and conflicts is prudent. Some more attention to this issue is given in the Africa chapter of the 4AR, which contains more references to conflict than any other chapter. Even so, the authors further argue, the IPCC does not fully accomplish its mandate in relation to climate change and conflicts. This is due in part to the state of the climate-conflict literature at the time, but mostly to the unsystematic standard for evaluating evidence and consulting relevant expertise on this particular issue. All in all, the climate change-conflict nexus is neither well-developed nor well-documented, in contrast with the robust scientific analysis of other climate change-related issues. But, hopefully, the IPCC has decided to tackle the security issues more directly in the Fifth Assessment Report, scheduled for publication in 2014. The report from IPCC's Working Group II will, in fact, contain a chapter on human security, including a section on conflict.

In chapter 4, 'Space, time and scales of human security in climate

change', Richard Matthew begins by discussing the universal versus particular narratives, then he examines the narratives of climate change and human security and explores the various scales at which climate change and human security can be linked. The chapter puts forward an argument about why these compelling, empirically grounded, and broadly relevant narratives may not generate an effective global response. The chapter concludes by arguing that there is an urgent need to establish global moral principles to guide thinking and particular responses to climate change. Without this, over the next few decades, a world might emerge of climate change entrepreneurs and climate change victims, a division that may ultimately increase the risk posed by climate change to all of humanity.

Part II, 'The determinants of human security in the climate change context', addresses the environmental and social determinants of human security in the climate change context, and then investigates the notion of vulnerability to climate change and of its constituent parts in relation to human security. Finally it analyses climate impacts and extreme climatic events, disasters, risk, preparedness and management, and their linkages to human security.

In chapter 5 'The environmental determinants of human security in the context of climate change', David Simon first emphasizes that environmental factors continue to impact upon human activities in diverse and important ways, even in high-income countries, and that the human security implications of environmental change are not scale-neutral and therefore demonstrate discontinuities and disjunctures when examined at different scale. The distinct but overlapping elements of environmental change are experienced in ways that reflect existing social, institutional, economic and physical urban structures. The poorest, least well-resourced segments of society will face the most extreme and sustained threats to their human security despite having the smallest ecological footprints and contributing least to the growth in greenhouse gas emissions that underpin environmental change. On the basis of these considerations the chapter puts forward an approach to understanding the nature of environmental change risk that distinguishes it from conventional disaster risk through a focus on the extent, severity and duration of exposure to extreme events and slow-onset changes in environmental conditions. Similarly, simplistic dichotomies of urban versus rural and (semi-) nomadic and nomadic versus sedentary forms of social organization and production are avoided, by means of a dynamic and more relational understanding of human adaptability in the face of changing circumstances. In this light, the chapter surveys many of the key likely dimensions of human security vulnerability in different environmental change contexts, ranging from coastal and inland urban environments in different agro-climatic zones to
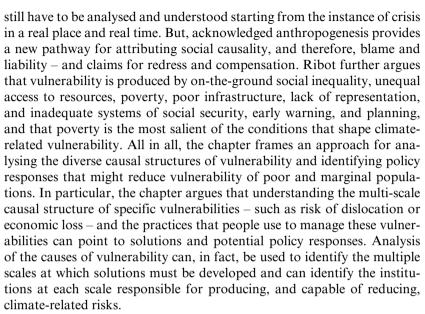
the progressive erosion of the productive environmental base underpinning remaining hunter-gatherer and pastoralist communities, freshwater and marine fisheries, and the particular complexities of specialized, globally integrated, capital-intensive, export-oriented commercial farming enterprises.

In chapter 6, 'The social dimensions of human security under a changing climate', Jürgen Scheffran and Elise Remling focus on the social dimensions, conditions and determinants of human security and related theoretical concepts. After a thorough analysis of the genesis of the concept of human security, they combine positive and negative security aspects for operationalizing human security as the task of shielding people from threats and empowering people in order to take charge of their lives. Then the authors analyse the linkages between climate vulnerability, adaptation and human security. Climate change, in fact, affects various dimensions of human security in multiple ways. Some of the climate-induced stresses may directly threaten human health and life, such as floods, storms, droughts and heat waves, others gradually undermine the wellbeing of people over an extended period, such as food and water scarcity, diseases, and weakened economic and degraded ecological systems. Once critical thresholds are exceeded, the risks of climate change may turn into existential threats to human security which will depend on the vulnerability of those affected. Scheffran and Remling go on to investigate the impacts of climate change on human needs, capabilities and sustainable livelihoods and also within people's broader social environment, which includes the social interactions and networks in which humans participate as well as institutions and governance structures. They further stress that climate change will particularly increase the burden on those people who are already under stress from other problems, and are lacking essential capabilities and freedoms to take actions that reduce vulnerability and protect human security. Due to low 'social capital' and resilience these groups may be easily overwhelmed by the multidimensional impacts of climate change which further disrupt their capability and societal stability. Against this backdrop the authors conclude that adequate policies for human security under climate change require a long-term planning horizon and an integrative framework to better understand the actual and potential adaptation needs of affected countries and communities from local to global levels.

In chapter 7, 'Vulnerability does not just fall from the sky: toward multi-scale pro-poor climate policy', Jesse Ribot explores causal structures of vulnerability and the relation of vulnerability to climate change. The causes of vulnerability can be traced in the social relations of production, exchange, domination, subordination, governance and subjectivity. They

still have to be analysed and understood starting from the instance of crisis in a real place and real time. But, acknowledged anthropogenesis provides a new pathway for attributing social causality, and therefore, blame and liability – and claims for redress and compensation. Ribot further argues that vulnerability is produced by on-the-ground social inequality, unequal access to resources, poverty, poor infrastructure, lack of representation, and inadequate systems of social security, early warning, and planning, and that poverty is the most salient of the conditions that shape climate-related vulnerability. All in all, the chapter frames an approach for analysing the diverse causal structures of vulnerability and identifying policy responses that might reduce vulnerability of poor and marginal populations. In particular, the chapter argues that understanding the multi-scale causal structure of specific vulnerabilities – such as risk of dislocation or economic loss – and the practices that people use to manage these vulnerabilities can point to solutions and potential policy responses. Analysis of the causes of vulnerability can, in fact, be used to identify the multiple scales at which solutions must be developed and can identify the institutions at each scale responsible for producing, and capable of reducing, climate-related risks.

In chapter 8, 'Disasters and human security: natural hazards and political instability in Haiti and the Dominican Republic', Christian Webersik and Christian Klose discuss the impact of natural hazards on human security. In particular, they analyse the cases of two neighbouring countries, Haiti and the Dominican Republic, that occupy the same island, Hispaniola, and that are exposed to a similar level of intensity of annual natural hazards (largely tropical cyclones and earthquakes). However compared to the Dominican Republic, Haiti was more politically unstable over the past decades. The chapter aims at examining the relationship between natural hazards and political instability in Haiti and the Dominican Republic in space and time, using hazard and political data from 1850 to 2007. The chapter demonstrates that natural hazards have no significant impact on political stability in either country. Even though there is no link to political stability, natural hazards affect both countries, especially those populations who are most vulnerable. Low incomes, ineffective government institutions, and environmental conditions reduce the capacity to cope with natural hazards and lower the capacity to adapt to future climate change impacts. Thus, the authors further argue, approaches are needed that respond to local needs through nature protection policies, including education of the public, legal measures to ensure environmental protection and participatory management for forests, fishing, agriculture, and tourism.

As well as the determinants pointed out above, climate change impacts

human security of diverse regions in different ways. For instance, some of the most impacted regions will be Latin America and the Caribbean, the Mediterranean, the polar region (North), and Africa. Part III of the volume, 'A regional perspective on climate change and human security', overviews the main threats to human security brought about by climate change in these very vulnerable regions.
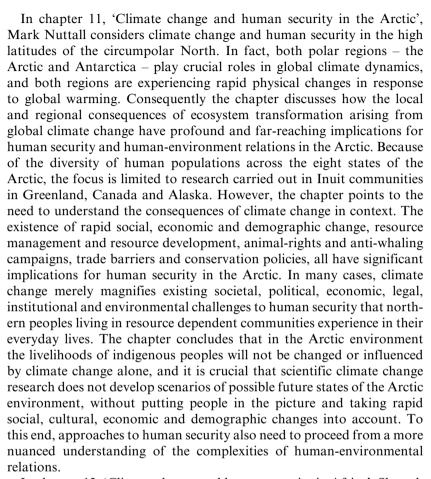
In chapter 9 'The impact of climate change on human security in Latin America and the Caribbean', Úrsula Oswald Spring, Hans Günter Brauch, Guy Edwards and J. Timmons Roberts focus on the impact of climate change on human security in Latin America and the Caribbean (LAC), particularly on climate change hotspots in Central America, the Caribbean, the Andes, and Amazonia. The chapter addresses four research questions. First, what have been the major conceptual human security debates in LAC countries since 1990? Second, what is the state of knowledge on climate change and its possible human security impacts for LAC? What strategies for climate change adaptation are being implemented in LAC and how are they being financed? And finally, how can projected policies for coping with climate change be interpreted from a human security perspective? To answer these questions, the chapter introduces two global discourses linking climate change impacts and security within LAC and discusses environmental and social vulnerability from a human security perspective. LAC strategies for coping with climate change are assessed and policy debates on financing their adaptation measures are examined.

Following the discussion of the Caribbean and Latin America, in chapter 10 'Human security and climate change in the Mediterranean region', Marco Grasso and Giuseppe Feola investigate human security and its intersections with climate change in the Mediterranean region. The chapter does so by measuring human security at national level, and by critically discussing an ethical approach for improving human security in the Mediterranean. The chapter shows that there exists a significant divide within the Mediterranean region whereby European countries have much higher levels of human security than Middle Eastern and North African ones, whose weakness and vulnerability is largely ascribed to the social, economic and institutional factors producing human security. The chapter further argues that in light of these unbalanced levels of human security and of the determinants that characterize the region, the inclusion of the ethical dimension in a regional approach to human security in the Mediterranean may promote its overall increase. The ethical dimension may mitigate the consequent conflicts among interests, so that the impacts inflicted by climate change on the factors determining human security can be effectively addressed.

In chapter 11, 'Climate change and human security in the Arctic', Mark Nuttall considers climate change and human security in the high latitudes of the circumpolar North. In fact, both polar regions – the Arctic and Antarctica – play crucial roles in global climate dynamics, and both regions are experiencing rapid physical changes in response to global warming. Consequently the chapter discusses how the local and regional consequences of ecosystem transformation arising from global climate change have profound and far-reaching implications for human security and human-environment relations in the Arctic. Because of the diversity of human populations across the eight states of the Arctic, the focus is limited to research carried out in Inuit communities in Greenland, Canada and Alaska. However, the chapter points to the need to understand the consequences of climate change in context. The existence of rapid social, economic and demographic change, resource management and resource development, animal-rights and anti-whaling campaigns, trade barriers and conservation policies, all have significant implications for human security in the Arctic. In many cases, climate change merely magnifies existing societal, political, economic, legal, institutional and environmental challenges to human security that north-ern peoples living in resource dependent communities experience in their everyday lives. The chapter concludes that in the Arctic environment the livelihoods of indigenous peoples will not be changed or influenced by climate change alone, and it is crucial that scientific climate change research does not develop scenarios of possible future states of the Arctic environment, without putting people in the picture and taking rapid social, cultural, economic and demographic changes into account. To this end, approaches to human security also need to proceed from a more nuanced understanding of the complexities of human-environmental relations.
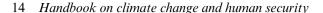
In chapter 12, 'Climate change and human security in Africa', Sharath Srinivasan and Elizabeth Watson start by examining the fundamental issues about climate change in Africa, and its impact upon freedom from want and freedom from fear. The focus is on how emerging science and local complexity are simplified, reinterpreted and deployed within the new discourse of climate change and human security. The chapter then shifts to two case studies that exemplify the politics of representation and of science and politics at different scales. The conflict in Darfur, Sudan, illustrates the ways in which the securitization of climate change activates a particular freedom from fear discourse that gives weight to certain phenomena and causalities over others, directly and indirectly serving selected interests at multiple scales. The case of Marsabit in Kenya exam-ines the ways in which debates about climate change and freedom from
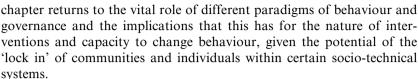
want also tend to overlook certain inconvenient sets of processes: often complex and contingent local ones that are ill-suited to the modalities and objectives of external interveners. The chapter finally warns that, unless vigilance is maintained, the discourse on climate change and human security – like many of the environmental discourses in Africa before – could be hijacked to serve certain powerful interests that demand that Africa and Africans need to be *saved* by new and powerful technologies, forms of transnational governance, waves of humanitarian relief and modes of investment.

Part IV of the volume, 'Responses to the threats posed by climate change to human security', focuses on the conditions that make it possible for individuals and communities to increase their human security in response to climate change, as well as to the built environment and critical infrastructures that are expected to increase, or at least to protect, human security against the impacts produced by climate change. The chapters provide both a positive analysis of the likely limited international architectures, policies and instruments for enhancing human security against climate change, and a normative analysis of what international institutions would be needed. Finally the notion of human security when framed as a human rights issue is explored, to point out the related duties that this approach involves, and how this standpoint can strengthen human security in the context of climate change.

In chapter 13, 'Climate change and human security: the individual and community response', Michael Hall explores some of the issues relating to the emerging human security and climate change agenda at the community and individual scale. The chapter argues that the challenge is as much conceptual, with respect to paradigms of behaviour and governance, as it is to the realities of climate change. The chapter is divided into three main sections. The first discusses the ways in which issues of human security and climate change response are framed. Such a discussion is regarded as fundamental to considering capacities to change and interventions to assist and enable such change. The chapter then goes on to examine the multi-level nature of responses to human security and climate change and the way that communities and individuals are embedded within broader social and economic structures. The critical role of trust and values in communities is noted, but it is also stressed that communities should not be romanticized, and it is vital to recognize that they may be ridden with conflict that makes appropriate sustainable solutions extremely hard to achieve. Similarly, the lack of capacity or willingness of individuals to respond to climate change, even if from an outsider's perspective this is the rational thing to do, is noted, with the challenges that this implies for the communication of risk and security. Finally, the

chapter returns to the vital role of different paradigms of behaviour and governance and the implications that this has for the nature of inter-ventions and capacity to change behaviour, given the potential of the 'lock in' of communities and individuals within certain socio-technical systems.

Chapter 14, 'Climate change, human security and the built environ-ment', by Karen Bickerstaff and Emma Hinton, explores the role of the built environment through the lens of improving energy efficiency and achieving comfort within the existing building stock – specifically through changing the behaviour of householders. By developing a socio-technical analysis of change – which places stress on the socio-material constitu-tion of everyday life – the chapter not only provides a critical review of dominant models of social transformation, and embedded assumptions about materiality and agency, but also offers an insight into the impacts, and efficacy, of policy efforts to materialize change. In particular future policy should not only focus on removing universal barriers to energy-efficient behaviours (apathy, ignorance, lack of financial interest), but also suggests, by attending to the materiality of innovation, new ways for the promotion of more efficient energy use. Finally, the chapter highlights the need to attend to the role of external players (governments, manufactur-ers, retailers), in supporting innovation that can encourage a re-evaluation and restructuring of normal routines. This would involve attending both to technologies that can favour pro-environmental behaviours, and to those that offer greater flexibility in the socio-technical distribution of agency and allow people to more actively engage with energy flows, and practices they sustain.

In chapter 15, 'Climate change and human security: the international governance architectures, policies and instruments', Michael Mason first reviews those limited global governance policies and instruments recruited to address the human security implications of climate change. This involves both a survey of the emergence of human security concerns within global climate governance – notably the UN Framework Convention on Climate Change (UNFCCC) – and the recognition by some security gov-ernance actors that climate-related harm represents a significant threat to the lives and livelihoods of many people. Reference is made to several gov-ernance initiatives to determine whether there is anything other than scat-tered institutional moves to enhance human security against major climate hazards. The chapter then carries out a normative analysis of whether a more integrated governance to this end is justified and, if so, what it might look like. In this regard the chapter argues that, while the global climate regime holds epistemic and governance authority over the man-agement of 'dangerous' climate change, the effective inclusion of climate

concerns in human security decision-making is most likely to be achieved by consolidating the legal coherence and force of the latter – especially in relation to the development of human rights and humanitarian norms on the prevention of climate harm. Such a rights-based architecture would also afford human security governance at least some protection from, and critical engagement with, the power-oriented politics of the international security system.

In chapter 16, 'A human rights-based approach from strengthening human security against climate change', Steve Vanderheiden addresses the question of whether imperatives surrounding climate change might usefully be cast in the language and politics of human rights, which comprise a subset of the moral rights that provide their ethical foundation. In fact, the right not to be harmed as the result of anthropogenic environmental change, especially when such harm involves serious suffering or death, can be regarded as among the most basic of rights. In the context of climate change this right bridges the categories of security and subsistence rights, as extreme weather events can threaten human security directly while climate-related scarcity can threaten subsistence indirectly. The chapter concludes by arguing that although both the seriousness of climate change as a global policy concern and the urgency of action to prevent climate-related suffering suggest the connection to human rights, which are properly reserved for humanity's greatest moral and political challenges, the 'upside' of invoking such rights on behalf of climate change mitigation might best be seen as political rather than philosophical. Among the political benefits of acknowledging these rights, the primary benefits may reside in the recognition and empowerment of current and potential sufferers of climate-related harm, rather than the legal mobilization of recognized political authorities.

From the foregoing discussion it will be evident that this volume seeks to perform two complementary functions. First it seeks to draw, from within its compass, a solid body of scholarship, much of which remains dispersed and, occasionally, located within specialized academic literatures. Second, the volume seeks to take the arguments about the relationship between climate change and human security forward, and in so doing forces us to reflect on both concepts, and the research which underpins them. The editors believe this is a critical step forward, and it is to be hoped that all the original papers published here will resonate with the academic and policy communities and, in turn, lead to a vigorous discussion and a more robust understanding of what is at stake for humanity.

NOTE

1. The expression 'managed senescence' we owe to Graham Woodgate. It continues the biological metaphor of organic growth and development but signals the gradual end of hydrocarbons as a way of achieving this.

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