Chapter 1
The Climate–Migration Nexus: A Reorientation

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Abstract The introduction discusses the current 'climate migrant' debate. It further elaborates on the topic of 'climate migration' from a sociological view point and introduces the chapters of the book.

Keywords Climate migrant debate • Migration theory • Numbers • Sociology • Uncertainty

1.1 Introduction

In February 2012 the Intergovernmental Panel on Climate Change (IPCC) published its comprehensive report on climate extremes based on the most recent scientific knowledge regarding the impacts of global warming (IPCC 2012). While there is no absolute certainty about these changes due to insufficient data for some regions, the report confirms a high degree of likeliness for many phenomena. There is an overall decrease in the number of cold days and nights accompanied by an overall increase in warm days and nights. This can be confirmed particularly for North America, Europe and Australia as well as for much of Asia. More droughts have been experienced in southern Europe and West Africa. There is also a statistically significant trend that heavy precipitation events are increasing in some regions, but decreasing in others, and that tropical storms seem to be shifting poleward in the Northern as well as in the Southern Hemispheres. With respect to

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future developments the report regards it very likely that warm spells over most land areas will increase. This will perpetuate the erosion of mountain areas that are now still at permafrost latitudes. The expected increase in heavy precipitation for some regions is likely to lead to more floods in catchment areas. Such observations and projections raise the question of how people living in the affected areas are going to deal with the climatic repercussions of global warming. That global warming could cause major migratory and refugee movements has therefore been at the forefront of concern since the establishment of the IPCC. Scientific focus has thus been put on the 'climate push' and vulnerability to climatic conditions.

Current research on the subject of environmentally and climate induced migration is still frequently narrowed down to climate change vulnerability and the environmental push factor, and therefore misses some of the complex interlinkages between societal and environmental vulnerability, migration and capability. The social construction of human–environment relationships, the social inequalities backing the unsustainable exploitation of natural and human resources, the efforts of persons affected to overcome such inequalities by geographical mobility, and the role of institutions in sometimes overcoming but often reproducing existing vulnerability and resource poverty have to be seen in conjunction. The need now is to transcend predominantly policy-oriented approaches which are limited by estimating numbers and identifying high risk zones. Such unreflexive approaches that barely consider the social contexts and conditions of migration are still dominant in the debate. The contributions to this volume fill this gap and shed light on the complexity of the nexus between environmental change, vulnerability and migration—and take the discussion to a new realm in capabilities for facing climate change.

This book casts serious doubt on whether existing terms such as 'environmental migrant' and a focus on projecting concomitant migration flows are appropriate tools to capture underlying processes of mobility and social change. Even more fundamentally, we criticize the theoretical and conceptual framework which seems to undergird the inflationary use of terms and numbers. Instead, we argue for a re-orientation of research on migration in the context of climate change and environmental degradation which is cognizant of the rich theorizing on human migration. This orientation implicates a move away from a concern with the invention of ever new terms to describe the phenomena and an abandonment of a futile search for the ultimate causes of migration brought about by climate change. We deem it important to re-orient this mushrooming field of research to consider the strengths of accumulated knowledge in the field of migration and bring it to bear on the complex relationship between anthropogenic climate change and migration. It is fruitful to think of climate change and migration as a two-way relationship, a nexus. In particular, this means a focus on the social frameworks, the processes and consequences of migration in the context of climate change. It is necessary to place migration in the fold of manifold structural social inequalities in and between national states. As to agents, it is necessary to go beyond the notion of vulnerability because it often hides the very active role human beings play in interacting with their 'environment'. Agency needs to be brought in, which means recognizing that migration is most often a proactive and not simply a reactive choice.

In a nutshell, we thus move from considering vulnerabilities to include capabilities. Seen in this way, migration in the frame of climate change is a case of spatial and social mobility, a strategy of persons and groups to deal with a grossly unequal distribution of life chances across the world.

Toward this end, we proceed to disentangle the confusion with the usage of terms and give an overview of the main strands of the 'climate migrant' debate, which exposes the bias of the debate on 'push'-thinking and the problem of the natural resource base. We will then reflect on vulnerability to climate change and environmental migration from sociological viewpoints before we introduce in depth the main insights from migration studies that could and should inform research on environmentally induced migration. With the complexity of migration decisions and processes in mind we discuss the challenge of double uncertainty inherent in investigations into climate-related migration, which explains the controversial nature of the estimations and projections of 'climate migrants'. Finally, we give an overview of the chapters and their specific contribution in illuminating the debate on environmental migration.

1.2 The Hassle with Terms: What We are Talking About?

There is a proliferation of terms related to the 'climate migrant' debate. One of the most frequently referred to in the debate is El-Hinnawi's definition of 'environmental refugees' used in the mid-1980s for the homonymous United Nations Environment Programme (UNEP) report, which included all 'those people who have been forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption (natural and/or triggered by people) that jeopardised their existence and/or seriously affected the quality of their life' (El-Hinnawi 1985, p. 4). This UNEP report was, however, not yet related to climate change, but to the environment–population–development nexus, and was then used to point to the problem of the breakdown of life support systems due to overexploitation of carrying capacities, for example, for livestock keeping (Kliot 2004, p. 72). The term was then extended to explicitly include people displaced by development projects or who have to flee industrial accidents (Jacobson 1988) and to comprise people fleeing environmental degradation as a cause or consequence of violent conflicts (Lonergan 1995).

The first report of the Intergovernmental Panel on Climate Change (IPCC) also used the term 'environmental refugee' in quotation marks and described it as 'people displaced by degradation of land, flooding or drought' (IPCC 1990, pp. 5–10). The second IPCC report used the term 'ecological refugees' (quotation marks again in the original) to refer to those fleeing natural disasters (IPCC 1996, p. 416). This understanding resembles the one Norman Myers used for his early estimates of 'environmental refugees' which he regarded to be 'people who can no longer gain secure livelihood in their erstwhile homelands because of drought, soil erosion, desertification, and other environmental problems' from which some 'flee' across borders and others become 'internally displaced' (Myers 1993, p. 752). Biermann

and Boas tried to be more concise and used instead the term ‘climate refugee’ embracing only people who flee the direct effects of climate change (within or across borders), that is, sea-level rise, extreme weather events, droughts and water scarcity (Biermann and Boas 2007, p. 8).

The use of the term ‘refugee’ in this context became quite disputed, however, because of its legal meaning under the Geneva Refugee Convention. Indeed, the United Nations (UN) refugee organisation did reject the use of the term ‘environmental refugee’ or ‘climate refugee’ and any attempts to broaden the mandate of the Convention (Piguet 2008, p. 2). This might have been one of the reasons why the term ‘environmental migration’ and ‘climate migration’ came into use. The third IPCC report, for example, is somewhere in between. It stated that ‘migration may be the last of a complex set of coping strategies’ to ‘adapt to interannual variability of climate’. Nonetheless, the report still uses the term ‘environmental refugees’ in quotation marks (IPCC 2001, p. 397). The fourth IPCC report, finally, did not use the term ‘refugee’ at all, but only spoke of ‘environmental migration’ emphasising at the same time that ‘there is a lack of agreement on what an environmental migrant is anyway’ (IPCC 2007a, p. 365).

In addition, the terms ‘eco-migrants’, ‘ecological migration’ and terms that suggest a lesser degree of a direct causal relationship such as ‘climate-related migration’ or ‘environmentally induced migration’ have been introduced into the debate. Research entities of international organisations such as the United Nations University or the research unit of the International Organisation for Migration (IOM) indeed undertook great efforts to define and elaborate on appropriate terms (e.g. Renaud et al. 2007; Laczko and Aghazarm 2009). Nonetheless, the fact that the IPCC and many others—including some authors of this volume—have a tendency to put the terms ‘climate migration’ or ‘environmental refugee’ into quotation marks is still a strong signal that the meaning of those terms is often ambiguous and anything but crystal clear. In the end, which combination of words is chosen and why depends to a great extent on the context. The word ‘refugee’ is still often used to highlight the emergency nature of the situation of such people and the responsibility to act and help them (as Biermann and Boas did). The word ‘migrant’ is used partly to avoid the term refugee, but also because it has a broader connotation and encompasses the diverse types of environment related population movements such as circular and seasonal migration, long-term migration due to slow onset changes, or short-term displacement due to sudden events. To stress the non- or semi-voluntary character of those movements the term is often endowed with a prefix such as ‘forced’ or ‘impelled’ migration. The word ‘climate’ might be used to emphasise the interrelationship with global warming and the climate change discourse. The term ‘environmental’ might be used instead to emphasise that it is often empirically not possible to distinguish migration triggered by global warming from that triggered by other sources of natural disasters (e.g. cyclical weather anomalies) and environmental degradation (e.g. overexploitation of natural resources). Moreover, even where such differentiation is possible, as is the case with volcanic disruptions, the emergency response does not look that different from climate related disasters.

In this volume the terms ‘climate migrant/migration’—if they are used—should not be regarded as well-defined concepts, but as terms that express, first, that the current debate on environmentally induced migration is closely attached to the climate change discourse and the expected increases in weather anomalies. Second, the term encompasses environmentally induced migration beyond displacement and flight. Nevertheless, such terms still support the main proposition of the debate which is that of the ‘environmental push’. The most frequently used terms in the volume are, however, ‘environmental migrant/migration’ which is meant to stress the complex relationship between climate and environmental change. The use of the latter terms in this book is usually not meant to embrace people who have been uprooted due to development investments and thus departs from the meaning that Jacobson and Lonergan coined.

1.3 Strands of the ‘Climate Migrant’ Debate

The climate change and climate migrant debate is generally deeply entrenched into the environment and population discourse. This discourse is firmly rooted in neo-Malthusian thinking, which emphasises the mismatch between humankind and its resource base (Saunders 2000). The field of population and environment studies (P&E) is a crucial case in point and tends to reproduce mainly three narratives of the environment-migration nexus (Hartmann 2010): first, the poor and landless in particular migrate to forest frontiers to access new land which leads to deforestation and further degradation (e.g. Geist and Lambdin 2001); second, environmental degradation and population pressure impels migration and produces environmental refugees (e.g. El-Hinnawi 1985); and third, migration leads to (ethnic) conflicts over scarce renewable resources and urban unrest in destination areas (e.g. Homer-Dixon 1999).

The ‘climate migrant’ debate has its origins in the latter two of the P&E narratives of migration and currently consists of five dominant strands. The five threads might be called the ‘ecosystem strand’, the ‘conflict strand’, the ‘refugee strand’, the ‘adaptation strand’ and the ‘relocation strand’. All of them assume a (more or less) direct link between climate change and migration, and share the hypothesis that the crucial nexus is a ‘push’ to move caused by the depletion of natural resources and capricious weather conditions (Schade 2012). According to this view land loss due to sea level rise, desertification and land slides, or water stress and storm surges lead to the deprivation of crucial livelihood assets and ecosystem services, and thus forces people to leave. This may happen suddenly due to hazard events or gradually due to slow onset changes. It might also be the result of exhausted coping capacities due to an increased frequency of extreme weather events that does not allow for substantial recovery.

The ecosystem strand thereby forms the initial base wherefrom the other threads depart. In line with the second P&E migration narrative the key terms are ‘environmental push’ or ‘climate push’. They suggest that ‘climate change’ is a

major trigger for forced and impelled migration.[1] Already the first IPCC report of 1990 argued that migration and spontaneous relocation 'may be the most threatening short-term effects of climate change on human settlement' (IPCC 1990, p. 9), thereby emphasising that developing countries in particular would be affected. Such warnings usually go hand in hand with the identification of high risk zones and the projections of the number of displaced persons due to climate change phenomena such as sea-level rise, coastal flooding, changes in the monsoon system and increased severity and frequency of droughts. The most cited figure in this regard is that of 200 million by 2050 (Myers 1996, p. 175). The prevailing message attached to these projections on extraordinary increases in impelled migration is usually that climate change has to be stopped. Some regard this strand of the debate therefore to be a lobbying strategy of environmentalists to increase pressure on decision-makers in order to mitigate climate change (McGregor 1994, p. 127).

Based on these dire predictions and in line with the third P&E migration narrative is the conflict strand. This strand encompasses the scientific community of peace and conflict studies as well as institutions concerned with security issues, who debate the potential for conflicts arising from such climate induced mass migration. The notion that environmental migration increases proclivity for conflicts was briefly raised in the second IPCC report with reference to Homer-Dixon and Suhrke (IPCC 1996, p. 496; Homer-Dixon et al. 1993; Suhrke 1993) and thoroughly adopted by the third report (IPCC 2001, p. 397). In 2007 it was again raised by the German Advisory Council on Global Change (WBGU 2007), and finally also adopted by relevant international organisations such as the UN Security Council, the UN General Assembly and the IOM (UNSC 2007; IOM 2007; UNGA 2009a and 2009b). Migration, in this context, is treated as one of the various security threats society has to deal with in a warming world, alongside issues such as territorial disputes and intra-state as well as internal resource conflicts.

The third thread of discussion, the refugee strand, is more concerned with human security and governance issues. Actors, mainly academics and nongovernmental organisations, have raised their voices to advocate a new regime for so called 'climate refugees' and/or to review and adjust existing international laws (e.g. WBGU 2007, p. 129; Bauer 2010). The discussions on how to protect climate and environmental refugees are, however, very diverse, ranging from legal analysis of currently available instruments (Ammer 2009; Ammer et al. 2010; Cournil 2011; Epiney 2011), to new policy proposals (Biermann and Boas 2007; Docherty and Giannini 2009). Of particular concern are the disappearing small island states and the challenges they face regarding provisions of asylum law and other ways to protect refugees' rights; the situation of internally displaced persons (IDPs, i.e. 'refugees' that do not cross borders) and involve conceptual and legal challenges (Zetter 2010); as well as the question of justice and compensation (Penz 2010), amongst others.

The fourth and fifth strands, adaptation and relocation respectively, move away from the alarmist overtones of the debate by offering solutions to the foreseen

[1] For categorisations of climate related "push factors" see inter alias Hugo 2010; Kniveton et al. 2008; Renaud et al. 2011.

disaster of imminent displacement and migration as a 'second-order effect of unsuccessful adaptation' (UNGA 2009b, p. 7). The fourth strand is instead concerned with the potential of migration for adaptation to climate change by generating remittances (Adger et al. 2003; Barnett and Webber 2010). This narrative was derived from the development–migration nexus debate and the work of migration research on the significance of remittances as a strategy for income diversification and coping with life risks, such as crop failures (Stark and Levhari 1982; cf. Faist 2008). Circular migration and remittances are promoted as a way forward to enhance people's capacities for adaptation by means of accumulating skills and resources at the place of origin. The IOM, for example, advocates such circular migration schemes between developing and developed countries as a form of adaptation to environmental degradation and resource pressure (de Moor 2011). Controlled migration is thus seen as a means to avoid uncontrolled migration and flight due to adverse living conditions in a warming world. Here migration evolves into a coping strategy to handle those resource base problems.

Finally, one preventive measure to avoid uncontrolled displacement, which can be labelled the fifth strand of the climate migrant debate, is that of planned relocation of vulnerable communities. Planned relocation is discussed particularly with reference to disappearing islands in the Pacific region (Boege, this volume; Campbell 2010; Ferris et al. 2011), but also with regard to dislocations related to floods (Stal 2009) and bank erosion (Dun 2009), and as a way to enable regeneration of overexploited ecosystems (Zhang 2009). Biermann and Boas (2007) even made preventive relocation the centrepiece of their proposed climate refugee regime that embraces all those prone to severe human suffering due to the direct impacts of global warming. Their solution again forms part of an answer to the resource base problem, and it seeks to solve it by resettling affected people to places with more reliable and viable conditions. Resettlement is regarded as the only possible measure to protect those who live in places where no in situ adaptation is feasible, and to avoid displacement and uncontrolled mass migration as a form of 'maladaptation'. Ordered relocation even found its way into United Nations Framework Convention on Climate Change (UNFCCC) negotiations and outcomes of the COP-16 in Cancun in 2010 (UNFCCC 2011, para. 14[f]).

In sum, although the climate migrant debate experienced a move from alarmist negative connotations of migration to more solution oriented discussions, all its strands are still centred upon the presumption of the natural resource base problem.

1.4 Some Reflections on Migration and Vulnerability from a Sociological Perspective

The premise of the resource base problem and the environmental push unfortunately overlooks the social conditions causing the problems and the social construction of the prospects for the proposed solutions (cf. Berger and Luckmann 1966). The underlying conceptualisation of migration in the 'climate migrant'

debate, and the terminologies and numbers it produced, have therefore been widely criticized by social scientists and migration researchers in particular (McGregor 1993; Cannon 1994; Kibreab 1994; Black 2001, Castles 2002). For an interim period this even led to a polarisation of the debate between 'alarmists' and the 'sceptics' (Gemenne 2011b, pp. 230–239). This characterisation, however, is misleading, because it suggests that 'sceptics' do not believe in the severity of climate change—like those who are sceptical about anthropogenic global warming—and thus would neither believe in its potential to uproot people. Instead, the so-called sceptics are concerned with the shortcomings of the existing concepts and approaches, and are reluctant to draw premature conclusions.

In particular the 'alarmist' strands of the climate migrant debate characterise migration solely as an expression of vulnerability and disregard the sometimes positive role of mobility in everyday life. In equal measure they disregard the multi-causality of social vulnerability to climate change, which leads us to bring in migration studies. The lopsided focus on the 'environmental push' as a 'root cause' for uprooting and displacement is partially deceptive, because social structures determine to a large extent whether an extreme weather event turns out to be a human disaster or not (Cannon 1994, p. 17f). We argue instead that the analysis of migration as well as vulnerability to environmental conditions have to be placed within the context of the structures of inequality across the globe. The degree of vulnerability or resilience and coping capacities respectively of certain segments of a population to environmental stressors depends heavily on societal structures (Bohle et al. 1994, p. 37; Adger and Kelly 1999, p 255). These are also a manifestation of social inequality within a particular society, and must certainly be considered on the local and national levels. The political marginalisation of the indigenous people in Chiapas (Mexico), for instance, is one of the reasons for the absence of lobbies to protect the rain forest from extensive logging by large wood traders. Deforestation resulted in huge mud-slides during exceptionally heavy rains that buried small villages of exactly those indigenous people (Alscher 2008).

Also, on the global scale patterns of inequality between nations and world regions and their historically rooted hierarchies of exploitation have an impact upon climate change vulnerability. In the Mexican case, for instance, logging is perpetuated by global demand for wood. It is thus not only extreme weather events and social inequality within Mexico that make the indigenous population vulnerable, but also global markets and purchasing power which are in turn incorporated into local and national patterns of inequality. Similarly, in Bangladesh the expansion of shrimp production for the world market resulted in the destruction of large mangrove areas which had protected the coastal areas against salt water intrusion (Stern 2007, p. 433). Moreover, shrimp production is less labour intensive and agricultural labourers left jobless, which also forces them to migrate to cities in search for new income. This leads us to a more general observation: Not only does global warming hit the developing world much harder than other parts of the world because of unfavourable geographic-climatic conditions. To an even greater degree, because of their structurally disadvantaged position, developing countries are not able to adapt as well as post-industrial countries. Moreover, the difficulties in adaptation

exacerbate the difficulties developing countries face in competing in markets (cf. Wallerstein 1974), again limiting their adaptive capacities. The character of such post-colonial societies—weak civil societies, great inequalities in income, as well as restricted access to resources, law and justice—feeds into the weak adaptive capacities of their societies (Roberts and Park 2006). We thus potentially observe a ratcheting effect resulting in a downward spiral to cope with climate change.

From a migration studies perspective mobility is, moreover, not an expression primarily of vulnerability but one of human agency. Migration is often a proactive and not simply a reactive choice. In many environmentally harsh areas mobility (rather than flight) often serves as a traditional coping strategy to deal with the scarcity of natural resources. The seasonal movements of pastoralists from wet season grazing areas to dry season grazing areas are such an example. In the form of labour migration—often to urban areas—it serves to spread risks, diversify income and enhance opportunities (Stark and Levhari 1982; Stark 1991). It is a useful strategy, for example, to substitute usury credits and lack of income opportunities for remittances. Moreover, it serves to insure families against crop failure where no formal insurance system exists.

The degree of voluntariness and agency involved in migration decisions might, however, vary to a large degree. Migration decisions must be analysed in the broader context of the livelihood settings and the ways livelihoods are embedded into societal institutions. If the latter—ranging from formal administrative structures and policies to informal social networks and civil society organisations—respond or do not respond to the demands and needs of the members of a society, two reactions are possible (Hirschman 1970): exit or voice. Exit as an option implies that out-migration from nation states or smaller administrative and social units has to be analysed in relationship to the capacities of the people (or the lack thereof) to change things in situ by raising their voice and exercising political influence. Exclusive political and legislative systems, for instance, deprive vulnerable groups of their voice option and thus restrict their search for in situ solutions (Faist 2000, p. 20ff.) in the face of climate change (adaptation) as well as other burdens. In this regard, vulnerability as a result of exclusion and inequality indeed strongly relates to a proclivity to migrate and to use the exit option. Crucial for voice is loyalty to the social unit concerned, for example, a village or a national state. Loyalty plays a major role if people feel very attached to their communities, their land and their ancestors. In some instances, exit and voice may even be complementary. If exit is succeeded by a continuing concern with the region of origin, by sending remittances for example, exit may contribute to voice in that it increases the range of options allowing for in situ adaptation of those who remained. However, to stay might likewise be the result of complete immiseration and lack of necessary assets to move or to improve conditions in situ, i.e. people are deprived of their voice as well as of their exit options. In such cases it is not a decision to stay but the plight of immobility.

To capture the human agency involved in environmentally induced migration as well as its limits, we have chosen to move conceptually from vulnerabilities to capabilities. The aim was to embed environmental migration within the broader

frame of the capabilities approach which was pioneered by Amartya Sen for development studies and since then adapted to various purposes (Sen 1981, 1992, 1999). According to Sen, capabilities are not the things that people may be able to do—their 'functioning'—but their capacity to choose and to live a life they value. Such functions include access to food or education, or mobility, and other aims which are important to her/his idea of a good life. For that, of course, they need basic resources to make decisions on the functions they want to be fulfilled. Such resources may include natural, physical, mental, cultural, social, economic, financial and political assets, and necessitate their advantageous embeddedness in societal structures and institutions. Yet Sen goes beyond an instrumental concern with resources to enable functions and brings in the intrinsic consideration that the choice of one's way of life and functioning is fundamentally important. In general, the term capability connects to the broader issue of human development which depends axiomatically on freedom to achieve those chosen goals. Ultimately, Hirschman's and Sen's approaches converge in that the ability to make choices is constitutive of agency.

Greater capabilities may be equated with lesser vulnerability, which is certainly true for impoverished and marginalized populations. If assets can be multiplied, livelihoods are more sustainable, and the eventual loss of one asset can be compensated for by the use of others. Accordingly, we understand vulnerability as lacking or being deprived of essential assets necessary to realize functions crucial to coping with environmental change. The specific role of migration has thus to be contextualized with regard to the other assets available to a person or household, including its political assets, its voice. And voice implies capabilities. Migration is thus shaped by the same assets available for in situ alternatives, their 'double uses', and the overall combination of tangible and nontangible resources available to an individual or a household. Whether migration is an expression of vulnerability or capability depends to a large extent on the degree of freedom or choice for exit or voice or a combination of the two. That migration can be chosen at all is a manifestation of capability, if the case of immiseration is avoided.

1.5 The Potential Contribution of Migration Studies to Research on Environmental Migration

Difficulties in conceptualizing and researching environmentally induced migration meaningfully arise from the complexity of migration processes. These are in most cases multi-causal and no single 'driver' such as environmental degradation can normally be isolated from other drivers, which may or may not be related to the environment. Failing or exploitative credit and labour markets, for example, are acknowledged incentives for migration decisions too (Massey et al. 1993, p. 436ff) and these might go hand in hand with environmental degradation. Migration processes are self-perpetuating and become partly independent of their original drivers, which is called 'cumulative causation'. They are path-dependent,

which means that migration follows the paths of previous migratory flows, irrespective of legal classifications and raised hindrances. Thus trying empirically to distinguish clearly climate driven migration from other types of migration such as environmentally, economically or even culturally driven processes would be close to impossible. To add a further difficulty, migration away from environmentally unsafe locations does not mean that the places of destination are better protected from environmental hazards. Hugo, for instance, observed that people move from the eroding and storm prone coasts of Asia to its coastal mega-cities, which are equally threatened by the increase in extreme weather events (Hugo 2010). If search for environmentally safer locations is the main reason for moving in this case, that would make no sense, but path dependency and cumulative causation can explain this at first sight counterintuitive mobility pattern. Finally, migration is non-linear, i.e. circumstances that might trigger migration in one case do not necessarily trigger migration in a case with comparable external conditions. A study of two Mexican villages with comparable environmental pressure showed that only in one of the villages did a considerable number of people choose to migrate. The inhabitants of the other village remained in their community, mainly because they had no migration history or tradition (Schmidt-Verkerk 2009). This is so because in addition to the proximate causes of migration an infrastructure for movement itself—for example, migrant networks and/or financial means—needs to be in place to lower the transaction and transfer costs involved (Faist 2000, pp. 96–123).

To account for migration in the context of climate change, as indeed all other migration situations, the conditions at the place of origin and the destination, as well as intervening factors along the migration route have to be taken into consideration. Most studies on environmental migration mentioned thus far focus solely on the place of origin and thereby often face problems linking existing migration unequivocally to environmental changes. Other obvious triggers for migration, such as economic, educational, political and cultural reasons and discriminative practices, are neglected, as are the dynamics of migration processes once they have unfolded. The role of intermediary factors and transnational ties such as social and informational networks, established migration roots, professionalized agents, costs of transport, and so on, are often not considered—even less so the possible impact of climate and environmental change on such factors and social spaces (Schade and Faist 2010, p. 9). Also, very few case studies reverse the optic and ask how environmental change at destinations might impact upon migration. Dry spells in the United States, for example, may slow down migration from Mexico, as demand for seasonal harvest workers decreases (Kniveton et al. 2008).

Fundamentally, migration often relies on supportive social networks and intermediary institutions that perhaps not everyone has access to. A person may lack the ‘right’ ethnic or religious affiliation or the necessary amount of money or social status to enter those networks and take advantage of them—to be entitled to them and their services. Such migration dynamics unfold within societal structures and institutions that are specific to the migration option, and that enable or constrain it. Cross-border migration in particular is subject to strong institutional

regulation by migration regimes as an intervening obstacle. This again mirrors the inequality between nation states and their respective citizens, because it is usually those who come from developing countries that face the greatest restrictions when they want to access economically attractive destinations of the developed world. Once persons have succeeded in crossing borders, there are still various challenges, not the least of which is the problem of transferring educational and occupational credentials. Internal migration is also shaped by societal constraints such as, for example, the lack of recognition of certificates and non-transferability of social security contributions within the states of a federation, or the presence of hostilities between groups.

Although networks facilitate movement, migration is still costly, requires resources and can be physically stressful. Therefore, degradation can just as equally lead to a decrease in migration. During the droughts of the 1980s in the Sahel zone, nomads could no longer follow their traditional trading routes, because the distance to be covered without new water resources became too long for their camels (Spittler 1987). Mobility has been re-established and improved by the wider use of trucks amongst pastoralists to transport livestock, which demands considerable investment by the people themselves or supportive institutions. The necessary resources to invest into migration cannot be mobilized in all cases. Rural–rural migration from arid northwest Ghana to the fertile Brong-Ahafo Region, which is a common local strategy to secure livelihoods and food production, abated during periods of persistent lack of rainfall (Geest 2009). To describe migration as a measure of last resort for the most poor and underprivileged people in third world countries (e.g. Stern 2007, p. 111; IPCC 2007b, p. 57) is therefore highly misleading. The appropriate reverse question is why so few people do not move despite troubling conditions (Faist 2000, p. 1).

Migration is seldom a mass flight that involves the move of entire households. This is also true for environmentally induced migration. As has been emphasized by the Sustainable Livelihood Approach (SLA) and New Economics of Labour Migration (NELM), migration is in many regions a household decision to send out some members to improve household income. Indeed, out-migration potentially can relieve the homestead from population and resource pressure and at the same time generate monetary and non-monetary remittances to ease conditions of life at the place of origin. Thus the fourth strand of the ‘climate migrant’ debate dealing with issues such as remittances regards migration as exit to be complemented by voice and enlarged capabilities. At the same time, we need to consider that migration is selective and mainly involves the working age population, that is, the same population segment which is usually required for local agricultural labour and other physically challenging work such as digging irrigation channels, which can lead to the deprivation of human resources for coping also with environmental challenges. It can thus equally result in negative impacts such as social fragmentation, or increasing inequalities within and between families, which lowers adaptive capacities of communities of origin to environmental and other stressors.

Migration studies can contribute significant insights not so much into the causes of migration but into the dynamics, that is, the processes and consequences of

movement. The impact of this research in accounting for environmentally induced migration have nevertheless been limited—probably because the mechanisms described have applied predominantly to international labour migration. Climate and environmentally induced migration—in contrast—has with the exception of the fourth strand so far been discussed mainly as a phenomenon distinct from labour migration. However, we need to consider that the processes of cumulative causation, originally developed for labour migration, can also be applied to migration in the context of environmental degradation. This means that we should not distinguish, from a theoretical angle, between labour migration, refugee migration, environmental migration etc. After all, labour migration and asylum are legal distinctions, used by states to classify migrants. Yet they are not useful for understanding the causes and dynamics of migration (Faist 2000, pp. 1–28; Bakewell 2011). Instead we need to study migration in the context of certain conditions, such as searching for additional or alternative sources of income, protection from physical or/and structural violence, or environmental degradation. The basic conceptual tools just mentioned, above all cumulative causation, can be applied to all of these contexts. Although migration research is well suited to account for the dynamics and the manifold social—political, economic and cultural—consequences of migration once it has started, it is not as helpful in predicting the onset of migratory flows. This shortcoming is aggravated by the challenge of double uncertainty due to the great diversity of the relevant factors.

1.6 The Challenge of Double Uncertainty

An improved understanding of environmentally induced migration is a challenge to both fields of science, climate change and migration. As explained above, the difficulties associated with the lack of predictability or generalisations about migration decisions are highly entrenched in the complexity of social structures. Great uncertainties are thus also involved in relation to societal capacities for adaptation, for in situ as well as migration options. Indeed, the solution oriented strands of the ‘climate migrant’ debate are also built upon a number of uncertainties with respect to the problem solving potential of their proposals.

It is toward these uncertainties that we now turn. They arise from both climate sciences and migration studies. As to climate sciences, although today the voices doubting the reality of man-made climate warming can largely be disqualified, there are still considerable imponderabilities in determining future climate change by climate modelling. There are major problems inherent in climate modelling. First, there is the non-linearity of climate change: we do not really know, for example, how reaching the tipping point, i.e. when the warming starts to accelerate further warming in an exponential manner, will feed back into the global climate system. One has only to think, for example, of the warming up of permafrost soils which sets free vast quantities of climate-unfriendly greenhouse gases like methane, or the diminishing of the albedo effect due to melting ice shields.

Second, the complex topographic characteristics that determine local climate and how to model their interaction with global warming must also be considered. Third, existing models face limits in taking into account anthropogenic sources of future climate change, for example, estimating the amount of future emissions that are highly dependent on technological and economic developments. Fourth, there are difficulties in modelling other societal factors that impact upon emissions and availability of carbon sinks, such as demographic factors or changing land-use, which in turn are highly interrelated. Fifth, the models have difficulty in accounting for possible natural sources of climate change such as major volcanic disruptions (Daniela Jacob, Climate Service Center, summarised in Schade and Faist 2011, p. 5). Sixth, and finally, the impact of climate change on some components of the climatic system are less then clear, such as the repercussions of global warming on cloud building and on the change of ocean currents (Björn Stevens, Max-Planck-Institute for Meteorology, in an interview with Vieth 2012).

Accurate predictions of climate change are thus not possible, because climate models are methods of projections in the sense of 'if … then …' statements. It is therefore not surprising that projections of global warming range between 0.79 and 4.16 °C by 2100 (Union of Concerned Scientists 2010)[2] and that projections of global circulation models and of regional climate models (though the latter are based on the former) at times do not achieve consistent results for a particular region, or may even reach opposing ones, as is the case regarding rainfall changes in Kenya (Schade 2011, p. 22f.). The uncertainties of climate change projections can be reduced by clustering multiple models. Yet there are also limits to building more complex models: the internal variability of the models serves as an indicator for the robustness of a projection, i.e. the larger, the less robust.

In sum, it is no exaggeration to speak of a challenge of uncertainty pertinent to the two fields of climate change and migration. With respect to the field of 'climate migration' this adds up to a double challenge of uncertainty. Attempts to forecast climate migration, i.e. how many people will be potentially displaced and eventually move, usually use simplified 'equations' based on a combination of expected impacts of global warming and demographic projections. However, such predictions have to be treated with caution. They are based on uncertain 'if … then' statements regarding changes in eco-systems. An example is projections based on rising sea levels. It is often assumed that a sea level rise of a certain magnitude affects specific parts of coastlands. The number of persons living within the range of a sea level rise is then predicted to emerge as climate refugees. In other words, demographic projections cannot overcome the uncertainties of climate change projections.

It is due to those cumulative uncertainties as well as to the multitude of meanings of 'environmental migration' and associated terms that there also exists a broad range of estimates of how many 'environmental migrants' we do and will have. Estimates of actual numbers range between: 10 million (Jacobson 1988), 25 million

[2] The source refers to a range between 2.1 and 11 degrees Fahrenheit (1°F equates 0.378 °C).

(Myers and Kent 1995), 30 million (El-Hinnawi in an interview with Milan 2004), 10 million annually Bogardi quoted in Adam (2005), 17 million in 2009 and 42 million in 2010 (Yenotani 2011; cf. Gemenne 2011a, pp. 2–4, includes an overview on the background and consistency of those estimates and predictions). According to EM-DAT the number of people affected by natural disasters reached a climax in 2002 of about 600 million (EM-DAT 2011).[3] Needless to say, like estimates of past and current numbers of 'environmental migrants', projections also vary largely depending on the definitions and assumption they are based upon. In 2007 Norman Myers adjusted his forecast of 200 million environmental refugees by 2050 to 250 million people (Myers in an interview, Christian Aid 2007, p. 48). The second most famous projection frequently mentioned in this context is that of Christian Aid amounting to one billion people 'forced' to migrate by 2050 (Christian Aid 2007, p. 1). This latter number is highly controversial and its use within the climate and environmental migration discourse is, moreover, misleading, because it is an attempt to predict the number of all kinds of displaced persons including refugees according to the Geneva Convention and internally displaced due to conflicts. It also comprises—and this is the by far largest number—645 million people evicted due to development projects, which fits under the notion of 'environmental refugee' coined by Jacobson and Lonergan (see above). 'Environmental refugees' in the more narrow sense constitute Myers's 250 million permanently displaced people as result of climate change and an additional 50 million people displaced by other natural disasters (Christian Aid 2007, p. 6).

This myopic concern with projecting numbers of migrants is probably a result of the attempt to be policy relevant at all costs. Instead of researching the two-way relationships between climate change and migration, including a critical analysis of existing policies that deal with climate change, most research engages in a projection into the future by making doubtful linkages between environmental change, such as x-level amount of sea level rise leading to y-amount of migrants produced by such change. Again, such superficial correlations omit the basic fact that persons are not simply passive victims of environmental change but change their environment by their social practices.

1.7 The Contributions to This Volume

Against the background of hitherto mostly unsystematic efforts to trace the climate change–migration nexus and the policy-driven character of the debate, the contributions to this volume focus on methodological innovations and the politics and policies of this nexus. The preceding discussion on the conceptual and

[3] EM-DAT defines, affected people' as the 'number of people requiring immediate assistance during a period of emergency which may include displaced or evacuated people' (CRED 2011, p. 9).

empirical limitations of the 'climate migrant' debate leads to reflections on the methodologies and methods appropriate to study the linkages between environmental and climate change and migration. These respective contributions are compiled in part I of this volume. Although not all chapters are explicitly concerned with the survey of migration patterns, the contributions provide for a broad spectrum of approaches that are valuable to consider if inquiries into the environment/climate/migration-nexus are planned. All of them offer pathways to capturing the complexity of the phenomenon in question. The contributions consider how to approach systematically the impact of environmental change on existing labour migration; the different ways in which migration, demographic factors, and adaptive capacities might inter-relate with each other; the difficulties in assessing and tracing the use of remittances as an adaptation strategy; and the potentials of econometric research on vulnerability and unequal coping capacities to study the question of environmentally induced migration. These concerns allow us to look at the issue of climate migration from different disciplinary perspectives and to be more precise about the use and challenges of the methodologies applied.

The second part of the book, on politics and human rights, raises the question of policies and politics in various ways. It portrays how the agendas related to 'climate migration' get constituted in the public realm. Transcending predominantly policy oriented approaches dominant in the debate, the contributions here open space to a more fundamental exploration of the subject. The question of vulnerability and the prospects and limits of human rights to protect those vulnerable to climate change figures prominently in this part of the book. It explicitly seeks to deepen analysis of the implications of proposed and implemented policies and adds normative considerations. The second part thus leads back to the question of capabilities—which will be reflected in the concluding chapter.

Richard Black, Dominic Kniveton and Kerstin Schmidt-Verkerk (Chap. 2) open the first section of the book on methodologies and methods by reminding us that even though there is an increasing number of studies on the nexus between climate change and migration, many of these lack a solid conceptual and methodological basis. The approaches most in use are conceptually flawed, as they tend to look at existing migration patterns and try to match these with existing projections on climate and/or environmental change with a clear focus on the places of origin. The authors thus try to break new ground by introducing an alternative approach. Instead of isolating the environmental/climate factor from other pushes to migrate, they take a macro-perspective and explore the sensitivity of existing migration flows to climate change. This approach thus applies basic insights of migration theory to environmentally induced migration. The authors call for inquiry into the susceptibility of the economic basis at the destinations of existing labour migration to climate change in order to draw conclusions on the potential impact of climate change on labour migration.

Robert McLeman and James Ford (Chap. 3) depart from the dominant perspective of the environmental push. Instead of simply asking why and where people move, they analyse the interrelationship between demographic and environmental change in four case studies from Canada—two of them in rural eastern

Ontario, two in Nunavut—using a combination of regional modelling, data from geographic information system (GIS), indigenous knowledge and census data. According to their findings, it would be far too simple to assume a direct causal relationship between environmental change, vulnerability and out-migration. Factors to be taken into consideration include not just the size of demographic change, but also its composition, its impact on social networks and the (possibly negative) impact of migration on in situ adaptation options of those left behind. All these factors influence each other in multiple ways.

Soumyadee Banerjee and his co-authors Jean Yves Gerlitz and Dominic Kinveton (Chap. 4) explore migration as anticipatory behaviour in situations of environmental threat, in particular of water hazards. They conducted a survey among 1,433 households in the Hindu Kush Himalayan region exposed to water stress. It is one of the first large-scale household surveys to focus on water stress as a possible cause for labour migration and target for the use of remittances. While migration may yield negative effects on family life and social cohesion, it also entails certain advantages such as diversification of income sources and better prospects for development, for example, by way of remittances. Throughout, the authors critically discuss the major challenges of data collection and analysis inherent in such a survey of migration patterns that were encountered during the study.

Tanvir Uddin (Chap. 5) presents his qualitative study of the 1998 floods and the interaction between household characteristics and flood exposure in Bangladesh. This is a much-needed longitudinal study which overcomes the cross-sectional bias of most prior research. The sampled data sets cover several years after the floods and include several time periods. The results show that household characteristics have significant influence on short- or long-term capacities, and on the ability to cope with and recover from those floods. In particular, the population's average level of education seems to be decisive for long-term recovery. Moreover, Uddin reflects on ways in which this kind of econometric study could be adopted to inquire into the linkages among hazard exposure, household characteristics, and the proclivity to migrate.

In the first contribution to the politics and policy section, Chloe Vlassopoulos (Chap. 6) addresses the issue of policy relevance of environmentally-induced migration. She identifies three types of political discourse—environmental migration as a multi-causal problem, climate migration as a consequence in an alarmist discourse, and climate migration as a solution. Those three threads of discourse on environmental migration correspond to three competing approaches to problem definition. A problem definition includes the definition of the affected groups/persons, the parties responsible for causing the problem, the design of a solution and identification of those in charge. Vlassopoulos concludes that the last and also most recent problem definition—climate migration as a solution—has turned out to be the most successful so far, because it best fits the existing institutional and political conditions. By elaborating on the institutions supporting those different problem definitions her analysis of political discourses offers insights into the societal construction of climate migration and the actors involved.

Volker Böge (Chap. 7) examines the efforts to resettle citizens from a group of islands, one of which has already completely disappeared due to sea level rise. His

study of an 'Integrated Relocation Program' deals with the resettlement from the Carteret Islands to Bougainville, both of which are located in Papua New Guinea. Böge identifies and analyzes five central challenges the program faced: (1) the cultural and spiritual dimension of land acquisition, (2) the weak relations between settlers and recipient communities, resulting in (3) conflict in the local context after relocation, (4) the lack or weakness of governance (e.g. 'lost' funds), and (5) the problem of burden sharing. The case shows that even with a high level of consciousness of the affected for the importance of maintaining capability, such kinds of autonomous relocation initiatives easily fail without appropriate institutional support.

Jeanette Schade (Chap. 8) discusses the policy response of planned relocation as a form of adaptation and its flaws. She presents the experiences with relocations in the context of development-based evictions, and early experiences with relocations related to environmental degradation and threats. She shows that not only climate change but the institutional responses to environmental and climatic problems could harm people's livelihoods. Schade points out that relocation might become a type of second-class adaptation for those who lack voice, or that it can be misused for political or economic purposes not causally related to climate change. As a perspective guiding policy choices, she offers a human rights approach to resettlement measures, with the objective of enhancing capabilities of the affected persons.

Megan Bradley and Roberta Cohen (Chap. 9) discuss an international framework for protecting environmental migrants. In their assessment, the challenges to human rights protection include the lack of conceptual and definitional clarity, limited legal protection and government failure to engage in prevention and protection. While most persons uprooted by environmental disasters will remain within their own countries, entitled to the protections set out in the internationally acknowledged 'Guiding Principles on Internal Displacement' of the UN, there is a need for greater clarity regarding the status and protection needs of those displaced by slow onset disasters and of those who cross international borders. In their opinion, a way forward could be the recognition of the need for human rights protection, the strengthening of legal protection, limiting vulnerabilities and maximizing capacities, as well as planning responses to statelessness in the case of disappearing nation states.

The concluding chapter by Jeanette Schade (Chap. 10) finally returns to the subject of capabilities and discusses Sen's entitlement and capability approach, including its philosophical and ideological underpinnings. She highlights the importance of Sen's ideas for livelihood research and development planning, which also informed many of the case studies presented here. After considering the contribution of this volume against the background of Sen's ideas, she offers a reflection on the relationship between Sen's capabilities approach on the one hand and human rights on the other hand. This allows her to discuss the question whether Sen's understanding of capability supports human rights-based approaches, the latter of which are proposed by some of the contributions. Though Sen supports human rights as 'ethical rights' for normative guidance he is not convinced of them as international legal—that is enforceable—rights, a position that the conclusion challenges.

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