Advances in Global Change Research 61

Robert McLeman
Jeanette Schade
Thomas Faist *Editors*

Environmental Migration and Social Inequality

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Environmental Migration and Social Inequality

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Abandoned sharecropper house, Oklahoma, USA. Exposed soil in foreground shows nutrient exhaustion from 20th-century monoculture cotton production in this semi-arid, drought-prone area. Photo: R. McLeman

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This book is dedicated to Professor Graeme Hugo. Professor Hugo was an ARC Australian Professorial Fellow in the Department of Geography, Environment and Population, and Director of the Australian Population and Migration Research Centre, at the University of Adelaide, Australia. One of the leading demographers of our time, Professor Hugo was internationally renowned for his research on population and migration, and for his important theoretical contributions and empirical analyses of migration's environmental dimensions. Professor Hugo had planned to contribute a Foreword to this volume, but passed away unexpectedly on January 20, 2015. He was a friend, colleague, and mentor to many of the contributors to this volume. He was an inspiration to all of us, and we miss him greatly.

Preface

It is widely recognized that changes in environmental events and conditions can influence migration patterns and behaviour. However, not all people experience environmental change in the same way. The nature of that experience is shaped by social inequalities that vary between (and within) regions, countries, communities, and households. As is shown in the chapters that follow, social inequality can be both a cause and an outcome of environmental migration. The aim of this book is to showcase recent developments in research into the complex relationship between social inequality, environmental change, and migration and to highlight opportunities for future research.

This book is the product of a conference held at Bielefeld University in December, 2012, as part of a biennial series of conferences on the theme, "Environmental Degradation, Conflict and Forced Migration". The conference series began in 2010 as a partnership project of the European Science Foundation (ESF), Bielefeld University, and its Center for Interdisciplinary Research, with the purpose of exploring the causal relationship between environmental change and forced migration, and the subsequent consequences. The 2012 conference focused on the role of social inequalities in environmentally induced migration and the mechanism of its reproduction. It was carried out with financial support from the government of France-funded research project "Exils Climatiques: Gérer les déplacements des populations dues aux phénomènes climatiques extremes (GICC-EXCLIM)" (http://www.reseau-terra.eu/exclim/), the European Cooperation in Science and Technology (COST) Action IS1101 on Migration and Climate Change (http://www.climatemigration.eu/), and Bielefeld University's Center for Interdisciplinary Research (ZiF) and Collaborative Research Centre "From Heterogeneities to Inequalities" (CRC 882). The organizers of the conference were Jeanette Schade, Thomas Faist, Chloé Vlassopoulos, Andrew Baldwin, and François Gemenne. The conference sponsors, organizers, and participants are warmly thanked for creating the conditions that made this book possible.

Chapters 2 through 12 underwent double-blind peer review prior to acceptance and publication. We owe a great deal of thanks to all those who contributed their time and energy to providing reviews.

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Most of all, we would like to recognize and thank the authors who contributed to this volume. We are sure you, the reader, will enjoy the chapters that now follow.

June 2015

Robert McLeman
Jeanette Schade
Thomas Faist

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Part I
Introduction

Chapter 1
Introduction: Environment, Migration, and Inequality—A Complex Dynamic

Robert McLeman, Thomas Faist and Jeanette Schade

Abstract Migration is one of many ways by which people have adapted, and will continue to adapt, to the rapid environmental changes of the Anthropocene. Scholarship on environmental migration has evolved from atheoretical push–pull descriptions of *environmental refugees* toward increasingly systematic investigations of how migration emerges from complex interplays of cultural, economic, social, *and* environmental processes. In recent years, environmental migration has often been conceptualized in relationship to human vulnerability to environmental change more generally (especially climate change) and human security. A next stage in the evolution of this scholarship is emerging, in which scholars are examining in greater detail the relationship between environmental migration, socio-economic inequality, and the capability of people to pursue their chosen livelihoods. This chapter traces these stages in the evolution of environmental migration scholarship, and presents a generic model of how social and economic inequality can be both a stimulus for environmental migration and a consequence of it. A short case study of the migration outcomes of Hurricane Katrina is presented to illustrate the workings of the model. An overview of the subsequent chapters of the book is provided, showing how each advances our understanding of the relationship of environmental migration and inequality through new conceptual, empirical, methodological, legal, and/or policy insights.

Keywords Environmental migration scholarship · Migration and inequality · Anthropocene migration · Adaptive migration · Hurricane Katrina

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1.1 Environment, Migration, and Social Inequality as Interconnected Processes

It is well established that environmental events and conditions influence human migration and mobility (McLeman 2014). Migration responses to environmental changes are increasingly regarded as strategies to improve the life chances of groups, families, and individuals (Black et al. 2011). Yet life chances are not evenly distributed within or across societies, and this uneven distribution contributes to greater social inequality. Experience shows that migration-based adaptation strategies do not always alter the larger picture of social inequalities for the better; in some instances they may exacerbate existing inequalities and generate new ones. Furthermore, in any given example of environmental migration, some groups or individuals may achieve improved life chances while others do not. In other words, environmental change, social inequality, and adaptive migration are interconnected, dynamic processes. In the volume you are about to read, a group of leading and emerging scholars from around the world offer their evidence-based insights into the relationship between environment, migration, and social inequality. In doing so, they build on an expanding body of scholarly literature and contribute to a public policy discussion that has taken on growing importance in recent years, as scientists, policymakers, and the general public grapple with the implications of anthropogenic climate change.

1.2 Adapting to the Anthropocene

It is worth asking how we came to this point in time when a discussion of the relationship between social inequality, environment, and migration warrants its own scholarly volume. Let us start with the basic elements of the relationship between the environment and migration. The physical environment sets the boundaries of the human habitat on Earth and creates conditions that make settlements and livelihoods potentially viable at particular locations (McLeman 2014). Over the course of millennia, the human species has adapted biologically and through social, cultural, and technological innovation to take increasing advantage of resources and conditions within that habitat. Population densities have become great where the availability of resources and the climate are most favourable (e.g., river deltas in Asia) and remain low in areas where resources are scarce, climate is harsh, and an enormous amount of social, cultural, and technological adaptation is needed to survive (e.g., the Arctic, the margins of deserts). Yet the environment is not static. It is continuously changing at global, regional, and local levels. Some changes unfold over long periods of time (e.g., glacial and inter-glacial periods) while others occur suddenly (e.g., earthquakes or volcanic eruptions). Some changes are driven by natural processes of biology, geomorphology, geology, or energy transfers. Other changes—especially in the past

century—are driven by human activity (e.g., deforestation, pollution, and greenhouse gas emissions). The dynamic interaction between a continuously changing environment and a continuously adapting human population is thus the most elemental level at which the diffusion of the human species and the resulting settlement, migration, and mobility patterns have been shaped over the course of our time on this planet.

Physical scientists have coined the term *Anthropocene* to describe a new epoch in which human activity has become the predominant force in reshaping the face of the Earth (Steffen et al. 2007). This epoch began in the 1800s with the advent of industrialization and mechanization, and the use of fossil fuels as our primary source of energy. The ongoing explosion in the size of the global human population and the concurrent expansion of economic activity have placed tremendous pressure on natural systems and ushered in an era of human-induced global environmental change. This change has been unfolding, and continues to unfold, in two ways:

- as an accumulation of local and regional changes such as forest cover removal, soil erosion, shoreline modifications, chemical pollution, coral reef damage, and biodiversity losses that collectively undermine the functioning of the global physical environment
- as systemic alterations to the functioning of global physical processes, through activities such as the release of substances that deplete stratospheric ozone, the discharge of micro-plastic pollution into the oceans, and the release of climate-altering greenhouse gases (Meyer and Turner 2002)

The impacts of these environmental changes are experienced at all levels—local to global—and have implications for all aspects of the human condition: our health, our economic well-being, our social structures, and so forth. Further, the rate and intensity of such changes are accelerating, which means that the scale of the adaptation challenges with which we are confronted is also rising (Hackmann et al. 2014).

The most far-reaching environmental challenge of the anthropocene epoch is climate change. We have known for almost two centuries that temperatures at the Earth's surface are influenced by trace gases in the atmosphere. Jean-Baptiste Fourier (1878 [English translation]) made the first such hypothesis in the 1820s; English engineer John Tyndall's experiments in the 1860s demonstrated the relative heat-absorptive capacity of various atmospheric gases; and by the end of the 19th century, Swedish physicist Arrhenius (1896) offered the first mathematical calculations of carbon dioxide's forcing effects on ground temperatures. Once the necessary technology (e.g., instrumentation, satellites, computer power) became available to measure, observe, and forecast the relationship between atmosphere and climate, 20th century scholars realized that anthropogenic emissions of carbon dioxide, methane, and other greenhouse gases (GHGs) were fundamentally altering the Earth's climate (for a more comprehensive history, consult Black et al. 2013). In 1988, physical scientists, environmental activists, and multilateral environmental organizations successfully persuaded the world's policymakers to task the

World Meteorological Organization and the UN Environment Programme with establishing the Intergovernmental Panel on Climate Change (IPCC). The role of the IPCC was (and continues to be) to provide policymakers with periodic updates on the scientific knowledge about the physical processes of anthropogenic climate change, the options for reducing GHG emissions, and the potential impacts of climate change and possibilities for adapting to them.

The IPCC's first report, issued in 1990, informed the drafting of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. Through the convention, most of the world's national governments agreed to track GHG emissions, take steps to avoid a dangerous level of GHG accumulation in the atmosphere, and help vulnerable countries adapt to the impacts of climate change. Each year since, signatories to the UNFCCC have met to negotiate strategies for implementing GHG emission reductions (known in UNFCCC parlance as *mitigation*) and for reducing the vulnerability of states and regions most highly exposed to the adverse impacts of climate change. This has led to an impressive array of international accords and initiatives including the Kyoto Protocol to reduce emissions from industrialized nations; a variety of technology transfer and cooperative emission-reduction agreements funded through the Global Environment Facility; the REDD program that seeks to Reduce Emissions from Deforestation and forest Degradation; and the Cancun Agreements that seek to channel adaptation assistance and clean development funds to the world's most vulnerable populations.

The scale and scope of international public policy in response to climate change is nothing short of remarkable and unprecedented. No other environmental challenge has ever received such concerted, lengthy, and well-funded attention from the world's governments. Yet in spite of this, global GHG emissions have continued to rise and in 2014 reached the threshold at which most scientists agree the accumulation becomes *dangerous* in UNFCCC language [400 parts per million (ppm) CO_2 equivalent].[1] This same year, researchers reported that the massive West Antarctic ice sheet had begun to irreversibly collapse (Joughin et al. 2014) and will eventually raise sea levels by two metres in addition to the increase already occurring due to the thermal expansion of ocean water.[2] If we are fortunate, the full effects of the collapse of Antarctic ice will not be realized for several more centuries. If we are not fortunate, the collapse could occur within the next two centuries —an uncomfortably short time in which to adapt to such a tremendous change.

Barring an unforeseen breakthrough in energy technologies and/or an *all-in* global initiative to slash GHG emissions so abruptly and quickly that the short-term economic consequences would be staggering, the imminent impacts of climate change on human well-being will be far-reaching and will exceed in economic cost any environmental challenge we have collectively faced to date. In the Arctic, the physical manifestations of anthropogenic climate change are already visible in the

[1]Some scientists suggest 350 ppm is the actual threshold for dangerous climate change (Hansen et al. 2008), in which case we passed the danger point in the 1990s.

[2]Mean sea levels are presently rising at a rate of approximately 3 mm per year (IPCC 2013).

form of receding ice on land and sea. As a consequence, northern communities are being forced to adapt through technological investments such as relocating critical infrastructure, and behavioural changes such as shifting hunting and fishing patterns (Ford and Pearce 2010). As sea levels continue to rise, many smaller northern communities are reaching the point where the costs of staying in place are becoming prohibitive, and the communities may eventually need to be abandoned entirely (Huntington et al. 2012). But this is just the thin edge of the wedge. The global physical impacts of climate change—including the intensification of storms, floods, droughts, and similar events that already displace people and affect migration patterns—will inevitably become manifest in more populated regions. We are poised to enter an era of settlement abandonment and consequent migration on a scale not seen in centuries, indeed millennia (McLeman 2011).

1.3 Need for Research on the Role of Migration in Adaptation

Adaptation to the consequences of climate change is receiving greater attention from scholars and policymakers, as it must. Thorough and systematic investigations of migration—as an outcome of and a contributor to adaptation processes—are needed. Despite there being a long and well-established body of migration scholarship dating back in western countries to Ravenstein (1889), migration scholars have been relative latecomers to the study of environmental migration generally and to climate-related migration specifically. The first wave of environmental migration scholarship that emerged in the 1980s was driven primarily by natural scientists for the benefit of policymakers. These scientists sought to make descriptive and conceptual links between forced migration and environmental changes (not only climate change but also land degradation, deforestation, fisheries decline, biodiversity loss, and water scarcity), and to quantify the potential for large-scale population displacements. The resulting *environmental refugee* paradigm, elucidated by El-Hinnawi (1985), led to forecasts of hundreds of millions of people becoming involuntarily displaced by mid-21st century and was embraced by researchers and policymakers interested in the implications of environmental change for international and regional political security (Myers 1989, 1993; Homer-Dixon 1991).

The atheoretical nature of the environmental-refugee paradigm and its push-pull/stimulus-response assumptions were soon criticized by social scientists for its simplistic understanding of migration causality (Hartmann 1998). Scholars working within the IPCC's vulnerability and adaptation reporting process (known as Working Group II) flagged the need to develop more theoretically grounded, empirically reliable knowledge of the relationship between climate and migration (Adger et al. 2007).

1.4 Migration Causality in the Context of Vulnerability and Adaptation

For much of the last decade, migration as it occurs in the context of climate change and other global environmental changes has been conceptualized and understood in the context of vulnerability and adaptation (McLeman and Smit 2006; Black et al. 2011). The term *vulnerability* as it is used in climate-change research and IPCC reporting has its origins in political-ecology approaches to the study of natural hazards (e.g., Burton et al. 1978; Hewitt 1983; Blaikie and Brookfield 1987) and was strongly influenced by Sen's (1977) entitlement approach to the study of famine (see Adger 2006 for a more detailed history). In its simplest conceptualization, vulnerability refers to the potential for loss or harm and is a function of the nature of the physical risks to which a population is exposed, its inherent sensitivity to those risks (e.g., agricultural communities being inherently sensitive to drought), and its capacity to adapt (Smit and Wandel 2006).

When framed in the context of vulnerability, migration becomes part of the wider suite of potential responses by which populations vulnerable to particular climate-change impacts might adapt (McLeman and Smit 2006). Of course, the actual nature of the relationship between environment and migration is much broader than this. Environmental migration can occur for many reasons other than vulnerability, such as the attraction of migrants to specific environmental amenities. Further, by focusing on migration within the context of vulnerability and adaptation processes, the agency of actors (migrants, potential migrants, and non-migrants) can easily be obscured or overlooked. Environmental migration research has therefore benefitted from the growing attention it has received from scholars in the fields of sociology, geography, development studies, demography, and refugee law. These academics observe that many questions and debates that have long challenged our understanding of migration behaviour and social behaviour more generally—such as questions of structure, agency, inequality, and power—must be addressed, if we are to better understand environmental migration and provide reliable advice to policymakers. This is seen in the findings and recommendations of concerted environmental migration research initiatives of recent years, such as the EU-funded EACH-FOR project, the CARE International-sponsored *Where the Rain Falls* project, and the British Government Office for Science's Foresight study of migration and global environmental change.[3] In a previous volume of scholarship that arose from a European Science Foundation conference, editors of the present volume and other migration scholars deconstructed the existing policy-oriented discourse around

[3]The website addresses for these projects are: EACH-FOR: http://www.ehs.unu.edu/article/read/each-for; Where the Rain Falls: http://whereterainfalls.org; Foresight: https://www.gov.uk/government/collections/migration-and-global-environmental-change.

environmental migration. They found a clear need to consider not only questions of vulnerability and adaptation, but to also recognize that environmental migration is inherently linked with unequal distribution of life chances between and within societies, and that the interplay of human agency, capabilities, and rights must also be explored (Faist and Schade 2013).

1.5 Linking Environmental Migration to the *Vital Core* of Human Security

In the 2014 report of IPCC Working Group II, discussion of mobility and migration takes up a significant part of a chapter dedicated to questions of human security, the latter being defined as "…a condition that exists when the vital core of human lives is protected, and when people have the freedom and capacity to live with dignity" (IPCC 2014, Chap. 12, p. 759). The *vital core* consists of "…the universal and culturally specific, material and non-material elements necessary for people to act on behalf of their interests" (ibid.). Recall that the IPCC does not conduct original research but is tasked with summarizing the latest research developments. By casting migration and mobility in the context of human security, the IPCC is reorienting the study of the environment-migration nexus. This approach is more consistent with the current trend for research which is grounded in social science that explicitly considers livelihoods, entitlements, and rights in the formation of vulnerability. One of the IPCC's key conclusions is that vulnerability is inversely correlated with mobility, implying that freedom of mobility is situated at the *vital core* of human security. We will return to this point later, as it is an important consideration in other chapters that deal with questions of mobility, migration, and rights in a time of rapid environmental change.

The IPCC's (2014) analysis of migration maintains many elements of past hazard-oriented/vulnerability adaptation-response approaches. This can be seen in the descriptions and analyses of the causal linkages between environmental changes and migration. However, the IPCC also emphasizes the multiple causes of environmental migration—that it arises from complex interactions of cultural, economic, environmental, social, and political processes—and that the inability to migrate out of harm's way may constitute as great a concern in terms of future climate adaptation. These latter two observations reflect closely the findings of the Foresight project (2011) and are consistent with basic understandings in migration research that there is a huge discrepancy between potential migrants on the one hand and actual migrants on the other (Faist 2000). The IPCC also observes that most people adversely affected by environmental events do not migrate but seek to cope and adapt in other ways (generally categorized as in situ coping strategies

or adaptations), even when inhabiting areas at considerable risk.[4] Unless it is already an inherent part of households' regular livelihood strategies, migration tends to be an adaptation of last (or close to last) resort, and those who do end up moving, voluntarily or involuntarily, tend to remain within their home countries (what is generally referred to as internal migration). This is consistent with empirical studies of international environmental migration (Obokata et al. 2014) and, more importantly, is yet another reminder that standard migration research—its questions, theories, and findings—offers considerable insights into the nexus of environmental change and human mobility.

The underlying non-environmental factors that distinguish migrants from non-migrants, and situations that give rise to environmental migration from those that do not are identified by the IPCC as "…social differentiation in access to the resources necessary to migrate influences migration outcomes" (IPCC 2014, Chap. 12, p. 12). In some instances, this means that particular groups, households or individuals within a given population might wish to migrate when faced with adverse environmental conditions but lack the ability to do so. This reflects the concerns about *trapped* populations whose vulnerability increases when they cannot relocate from areas that are inherently risky, without outside assistance (Black et al. 2012). In other instances, and here the IPCC relies heavily on the example of displacement and resettlement patterns in New Orleans following Hurricane Katrina, structural socio-economic differences within a population that have been created along lines of poverty, culture, and race may prevent marginalized people from remaining in (or returning to) their homes and force them to relocate elsewhere (Fussell et al. 2010; Groen and Polivka 2010). The IPCC also observes gender differences in the displacement and migration outcomes following extreme events. They additionally note that those who do migrate away from environmental hazards may be worse off having taken on debt to finance their migration and/or by migrating to locations where social vulnerability is even greater, such as urban slums. Although it does not explicitly do so, the IPCC is moving beyond a simple vulnerability-based interpretation of climate-related migration toward one that emphasizes capability.

What we see is the IPCC grappling with a complicated, dialectic relationship that researchers are actively trying to understand better—the role of social inequality (and its various dimensions of resources, status, power, etc.) as a cause and an outcome of environmental migration. We know through numerous past studies that environmental and socio-economic processes interact with one another in complex ways. Within these interactions lie differences and heterogeneities that vary from one place and population to the next and become manifest along lines of wealth, education, age, gender, citizenship, and cultural norms, to name a few. Depending on the nature of the environmental event or condition and the socio-economic dynamics in play at a particular time or place, different types of inequalities may heighten vulnerability, moderate it, and/or

[4]It is worth noting that scholars distinguish between coping strategies or mechanisms that are reactive in nature and are enacted to maintain or recover basic human needs, and adaptations that may be reactive or proactive but in either case entail some degree of looking beyond immediate basic needs.

affect the ability of those exposed to decide whether to migrate (or not). Identifying the types or categories of inequality that are most relevant and the particular circumstances under which they become relevant is an important area for research if we are to better understand environmental-migration dynamics. But this in itself is insufficient because inequalities within any given population or society do not materialize out of thin air. Attention must also be paid to the mechanisms that produce (and perpetuate) inequality and limit people's capabilities if we are to (1) craft proactive public policies and programs to reduce vulnerability to environmental risks (that is, to reinforce the *vital core* of human security), and (2) reduce the likelihood of environmentally related forced displacements and distress migrations—the least desirable forms of environmental migration.

Before describing the contributions this volume makes to enhancing our understanding of these issues, it is worth reviewing some examples of what scholars elsewhere have said on the subject.

1.6 Inequality, Capability, Vulnerability, and Environmental Migration

Time after time, whenever tropical cyclones, floods, droughts, and other extreme environmental events have occurred, it has been visibly and statistically obvious that particular groups of people are more vulnerable than others. During the severe droughts of the 1930s on North America's Great Plains, it was the landless, rural poor who suffered the most (McLeman et al. 2008) and whose faces appear in the iconic images of the Dust Bowl captured by US Farm Security Administration photographers (Fig. 1.1). This pattern repeats itself today even when droughts strike culturally, socially, and economically different countries such as Iran, Kenya, and India (Keshavarz et al. 2013; Eriksen and Lind 2009; Deshingkar et al. 2008). But landlessness and poverty are not the only factors that distinguish those who are disproportionately vulnerable to environmental extremes. Global statistics kept since the 1980s show that women are eight times more likely to be killed in natural disaster events compared with men (Neumayer and Plümper 2007). When a cyclone struck Bangladesh in 1991, five times as many young women were killed compared with young men (Aguilar 2004, see also Chap. 9 for further details). When one recalls media coverage of New Orleans following Hurricane Katrina, it is hard to forget the images of thousands of desperate people huddled in the Superdome football stadium, most of them poor, most of them African-American, waiting for government assistance that was slow and chaotic in arriving. Time and again, factors such as poverty, landlessness, gender, age, and membership in a racial, ethnic, or cultural minority are the key indicators of those who are more vulnerable to environmental events and conditions.

Yet, as shown in the many recent studies of environmental migration cited in this chapter and in our previous volume (Faist and Schade 2013), the most vulnerable people are not necessarily those most likely to participate in migration. Or, when

Fig. 1.1 Dust Bowl refugees by the roadside near Bakersfield, California, 1935 Image by Dorothea Lange. US Library of Congress Prints and Photographs Online Catalogue, reproduction number LC-DIG-fsa-8b26859. Public domain image http://www.loc.gov/pictures/item/fsa1998017873/PP/

they do, their migration patterns and behaviour are often distinct from other groups. Clearly there is a disconnect between the degree of harm caused by extreme environmental events and the migration patterns observed after the event. The poorest of the poor typically did not migrate away from the Dust Bowl states; they were more likely to be trapped in poverty and remain in their home state or region (McLeman et al. 2008). Many rural, landless households in India, Iran, and Kenya see members migrate away in search of work during droughts, leaving behind other household members to suffer through the hardship. And some of the poorest households send no migrants at all (Deshingkar et al. 2008; Keshavarz et al. 2013; Eriksen and Lind 2009). Although inequality, vulnerability, and environmental migration are undoubtedly connected, it is not a straight-line connection where A + B = C. We cannot say unequivocally that inequality + vulnerability leads to environmental migration. Other factors intervene.

What is often found in empirical case studies of environmental migration (including examples cited in this text) is that people at the bottom of the socio-economic spectrum, who are society's most vulnerable, often have few migration options. Their capability—in terms of having both resources to undertake migration and the freedom or agency to choose their preferred migration (or non-migration) outcome—is limited by inequalities generated by social, economic, cultural, and political/institutional processes over which they have little influence. The relationship between inequality, vulnerability, and migration possibilities is illustrated in Fig. 1.2, which is based in part on the model of environmental migration produced in Foresight (2011). The interactions of cultural, economic, social, political, and institutional processes (a) produce distributions of

wealth, resources, and agency within a given population (b). In a society where there are inequalities, particular groups get pushed to the bottom of the spectrum in large numbers. The potential to experience loss or harm from a given environmental event or conditions (i.e., vulnerability) is directly and positively related to a household's access to resources (Adger 2006; IPCC 2014). And those with the least access to resources often live in the most exposed areas and/or have the least capacity to cope or adapt, thus giving us the vulnerability spectrum (c), which closely resembles spectrum b. From environmental migration literature, we know that the spectrum of migration possibilities (d) is also directly and positively influenced by spectrum b. Those at the lowest end of the migration agency spectrum d may have little or no possibility of migrating and have the potential to become *trapped* populations. Those who are not trapped but have limited capabilities may have few possible migration options and these options may be undesirable because they could leave them less well-off. Conversely, those at the top of spectrum d may have any number of migration options. But for them, the marginal benefits of migration are compared with much wider in situ adaptations. This means the potential benefits of migration will have a much greater range than for those with more modest capabilities. In Fig. 1.2e shows a Kuznets-curve-type range of

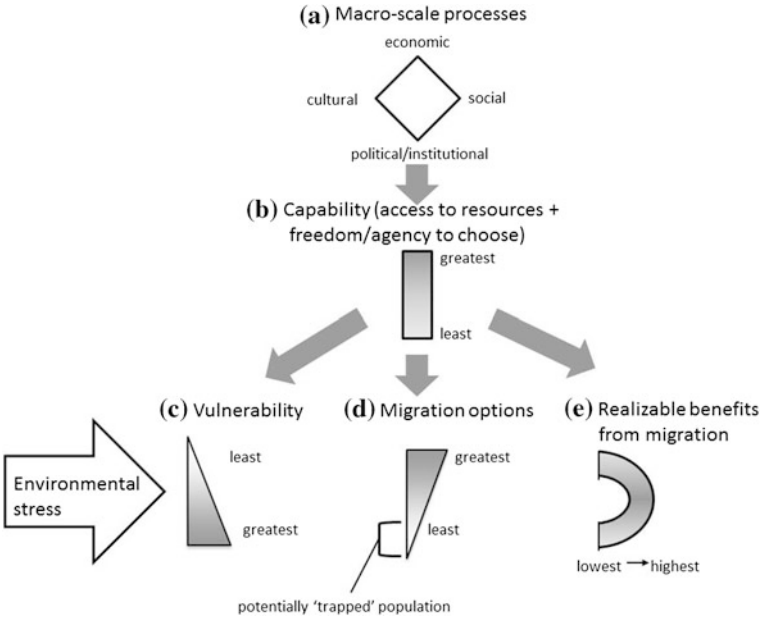

Fig. 1.2 Generic representation of the relationship between inequality, vulnerability, and environmental migration. *Source* Authors. Note that Fig. 1.2 is a highly generic and simplified representation of processes where complexity dominates. It should not be seen as static or deterministic. Its purpose is to illustrate that when societal processes in part *a* place certain groups disproportionately at the lowest end of spectrum B, environmental migration outcomes for those groups do not necessarily mirror their actual vulnerability

potentially realizable benefits or returns to migration which, in this case, reflects a population where those with the greatest capabilities are better off adapting to environmental stress through ways that do not entail migration—which was the outcome of both the Dust Bowl and the Hurricane Katrina examples.

1.7 Inequality and Environmental Migration: Lessons from Hurricane Katrina

Hurricane Katrina is a particularly good example of the interplay between inequality, vulnerability, and environmental migration. The migration outcomes in New Orleans following Katrina reflect multiple dimensions of inequality, including poverty, land tenure, gender, race/ethnicity, age, and citizenship. Katrina was a storm in 2005 that killed an estimated 1800 people and caused US$125 billion in damage along the U.S. Gulf of Mexico coast (Brunkard et al. 2008; Melton et al. 2009). The New Orleans metropolitan area, which lay directly in the path of the storm, saw a half-million residents evacuate or become involuntarily displaced from their homes when protective levees (Fig. 1.3) and pumps failed in the face of heavy rains and a large storm surge (Elliott and Pais 2006). Some neighbourhoods were

Fig. 1.3 Mississippi river levee at Algiers, Louisiana, directly opposite New Orleans *Photo* R. McLeman

flooded to a depth of 4 m, and it was 40 days after the storm before the city was finally drained. The days immediately before and after the storm were chaotic (Melton et al. 2009; Jonkman et al. 2009). While 70 % of the population obeyed the mandatory evacuation order, tens of thousands did not (or could not) evacuate and became trapped (Elliott and Pais 2006; Nigg et al. 2006). Most of those who were able to evacuate using their own resources remained within the state of Louisiana, going either to suburban communities or to Baton Rouge, the state capital and second largest city (Frey et al. 2007). Others evacuated to urban centres in nearby states. These destinations were selected usually because evacuees had family networks or social connections they could draw upon for temporary support. Those who were trapped in New Orleans and had to rely on disorganized government authorities for evacuation assistance were bussed to neighbouring states. Most were first taken to a football stadium in Houston and, when this became full, authorities began transporting people to Dallas, San Antonio, and farther afield.

In the aftermath of the storm as the city recovered, not everyone who was evacuated returned. The population of New Orleans was smaller in 2014 than it was in early 2005 before the storm (Fig. 1.4). It also became socially, economically, demographically, and racially very different after the storm. The neighbourhoods of New Orleans that experienced the highest rates of permanent out-migration were those with:

- the highest percentages of people living in poverty
- the fewest key services (schools, medical clinics, shops, etc.)
- high housing densities
- high percentages of elderly residents
- high percentages of households with dependent children and/or people needing nursing assistance (Myers et al. 2008)

Neighbourhoods with these characteristics were not randomly distributed across the city. They were found in areas that were highly exposed to flooding. Many of

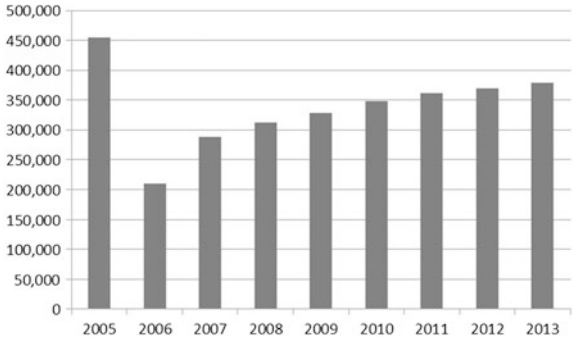

Fig. 1.4 Population of New Orleans (Orleans Parish) pre- and post-Hurricane Katrina. *Note* Population counts are done annually on July 1. Katrina struck in August 2005 (www.census.gov)

these neighbourhoods sprang up when the U.S. government built new levees after Hurricane Betsy in 1965. Before then, these locations were seen to be too low-lying and flood-prone to be safe (Kates et al. 2006). Some of these areas were without electricity and municipal water for over a year after Katrina. Unsurprisingly, return to such neighbourhoods was much slower and rates of housing abandonment were high. These neighbourhoods were also disproportionately populated by African Americans and minorities. This race-based underpinning of socio-economic inequality became apparent in evacuation statistics and return rates. Ninety percent of those who needed government evacuation assistance and were consequently scattered to Houston's football stadium and beyond, where they had no social networks, were low-income African Americans (Brodie et al. 2006). While nearly 60 % of white residents had returned to the city by 2009, only 40 % of black residents had returned (Groen and Polivka 2010). Inequality was exacerbated by the post-Katrina housing markets. After the storm, the city was left with 100,000 fewer habitable housing units, causing rents to soar and making it very difficult for low-income families to return (Vigdor 2008). Those who owned their own homes were more likely to return than those who had been renting (assuming those homes were still habitable). Here again, racial inequalities became apparent, as homes owned by white families tended to be in locations that suffered less damage than those owned by other racial groups (Fussell et al. 2010).

Yet there is more to the story than a simple narrative of race-based, spatially institutionalized poverty that determined who left New Orleans permanently and who came back. Access to social networks and the social capital that flows along them were important influences on return rates to New Orleans. In a detailed study of hard-hit neighbourhoods in the east end of New Orleans, Li et al. (2010) found that return rates were especially low for African-American households headed by women. They traced this to the relatively weak social networks of these households and their consequent heavy reliance on meagre government assistance. Their experience contrasted sharply with that of the east end's small Vietnamese population that, prior to Katrina, was disproportionately poor and completely disconnected from the city's political power structures. This community successfully leveraged its social capital through non-governmental institutions like churches and social connections with the Vietnamese diaspora in other U.S. states. They self-organized their evacuation and re-established themselves as a community quickly after the storm. In this way, they maintained a strong population and in the process increased their political and socio-economic influence within the city (Airriess et al. 2007; Li et al. 2010). The Vietnamese experience shows that access to informal socio-economic resources can, under the right circumstances, offset a lack of access to formal power structures and institutional resources and provide even a disempowered community greater agency in choosing its fate in terms of migration or non-migration.

After Katrina, New Orleans saw an influx of new migrants of Latin American origin, many of them young men without legal permanent-resident status (Fussell 2009). The rebuilding of the city created many jobs in the construction industry, and in their haste to rebuild the city as quickly as possible, authorities turned a blind eye

to the hiring of illegal workers and the wages paid to them. The city has since become an important destination for undocumented Latino migrants to the U.S. This has created a new community of low-income people that find themselves socially and economically marginalized in New Orleans, but who come because local labour-market conditions provide better economic prospects than other U.S. destinations. The Latino influx occurred at a time when low-income African Americans were struggling to find employment and when affordable housing was already scarce. This clearly demonstrates how the government authorities' willingness to tolerate institutionalized poverty and social inequality remains unchanged.

This short summary of post-Katrina migration patterns shows that, if we wish to better identify the influences of inequality in the patterns and outcomes that environmental migration may take, we need to pay attention to how inequalities are embedded in formal institutional arrangements. Examples of places to look could be in land-tenure arrangements and housing markets, or labour markets and how they are regulated (or not). Inequalities along lines of gender, age, and health (e.g., households with infirm dependents) can have a significant influence on the capability of households to adapt and place severe constraints on their mobility and migration agency. Further, we must recognize that not only can inequality influence environmental migration, it can also be a product or outcome of environmental migration. Environmental migration can reveal new concerns about citizenship (i.e., state-based recognition of who is *legal*), power(-lessness), and who can access or influence formal institutions and who cannot.

1.8 The Contributions of This Book to Existing Knowledge

The chapters that follow provide a cross-section of the current state of research as it relates to the inter-connections between inequality, capabilities, and environmental migration. The authors also point to a number of promising research directions that have yet to be pursued. Some of the chapters draw on empirical research in countries where acute environmental challenges have influenced migration patterns. These include Bangladesh, China, Ghana, Burkina Faso, Turkey, Haiti, and Mexico. In each case, the authors document how various types of inequalities emerge from societal processes (i.e., economic, political, social, and/or cultural processes) and how these in turn influence the capabilities of individuals, households, and communities, and their migration agency and mobility options, and, ultimately, shape the migration patterns that emerge in times of environmental stress or hardship. The methods used by the authors vary from highly qualitative to highly quantitative depending on the local contexts and the particular research questions being pursued.

Elsewhere in the book, authors who have worked in Bangladesh and sub-Saharan Africa reflect on conceptual and methodological considerations—specifically, gender and translocality—which researchers may wish to consider when working in this

field. The book also considers broader political and policy-making considerations of environmental migration and inequality, looking at questions of statelessness and the implications of how we define environmental migrants.

Although the empirical studies in the book showcase a variety of geographical regions and methodological approaches, common themes emerge as authors disentangle the connections between inequality, capabilities, and migration outcomes in environmentally stressed areas. Overarching themes include findings that environmental migration outcomes are strongly influenced by households' capabilities, that migration has implications for future vulnerability and capabilities, and that institutionalized inequalities must be addressed if capabilities and adaptive capacity are to be enhanced.

Etzold and colleagues describe how the livelihoods and food security of rural households in northern Bangladesh are heavily influenced by the variability of rainfall quantity and timing. There is an easily observable pattern of seasonal migration in and out of rural areas that coincides with the *monga* period, when household food supplies are at their lowest. Participation in this seasonal migration is not driven solely by climatic factors, but is strongly influenced by local patterns of social inequality and food insecurity as well as large-scale structural economic disparities across Bangladesh.

Rademachaer-Schultz and Schraven look at seasonal migration in the dry-land region of northern Ghana. There, people used to migrate during the dry season when food was scarce and their labour was not needed. Lately, the timing of out-migration has shifted to the rainy periods, especially among poorer and vulnerable households. These migrants are lured by opportunities in small-scale, informal mining elsewhere in the country. However, this results in reduced farm productivity and increased risk of food scarcity for those left behind should the migrant not remit sufficient funds to offset the absence of his or her labour. The consequences of this shift in the timing of seasonal migration include a rapid devaluation of subsistence agriculture in northern Ghana and a considerable redistribution of capabilities and vulnerability.

Lasailly-Jacob and Payraut also describe environmental migration in West Africa. In their case, they look not at drought or dryness but at how heavy rain events can trigger floods and consequent migration in Burkina Faso. Among many things, they find that those who were displaced by floods in the capital city have been far more visible to government authorities and the media—and consequently have received greater assistance—than the displaced residents of rural areas and smaller cities. The latter find themselves with less capability to cope with future risks (environmental or otherwise) and often with little choice but to resettle in locations that are as exposed or even more exposed to environmental risks than where they lived previously. The invisibility of the most vulnerable people to institutions and authorities that might assist them to develop their capabilities is an important consideration.

This notion of invisibility appears again in the chapter by Tan and colleagues. In China's densely populated Yangtze River delta, they found that the poorest segments of the population are especially vulnerable to environmental risks

(in this case, the impacts of climate change) due to their lack of access to state-provided employment, housing, health services, and education. Often these are recent migrants from rural areas who, unaware of how to access such benefits and having little or no influence over or access to institutional decision-makers compared with better-established residents, find themselves in positions of increasing vulnerability. Given the state's strong political and economic control in China, the authors conclude the onus falls on the government to develop programs to address not simply economic disparities within the region—which have been the focus to date—but also address the wider inequalities in terms of social status and power that presently flourish.

The role institutions play in addressing (or failing to address) the underlying inequalities that create environmental vulnerability and migration takes us next to Turkey's Konya plain region. Lelandais describes the Turkish government policies on drought, desertification, and agriculture which tend to ignore the entrenched structure of the region's farm economy, where wealth and power is controlled by a small number of large landowners. The knowledge of local authorities is often ignored by distant federal agencies that insist on micro-managing efforts to combat drought and desertification. As a result, policies and programs rarely trickle down to meet the needs of the large number of farmers who work small holdings and lack the necessary means to invest in irrigation systems to help them adapt to a drying climate. Consequently, increasing numbers of farmers migrate to work as wage labourers in urban centres or as greenhouse workers in the Antalya region, which, like the case of northern Ghana, has implications for the capabilities of the community members they leave behind.

The Turkish case describes how environmental processes and social inequalities influence internal migration patterns. By contrast, Mezdour and colleagues trace the environmental influences on international migration from Haiti to Canada. The authors tease out a complicated set of events that begin with the collapse of rural livelihoods due to endemic deforestation and erosion, and lead to large numbers of the rural population migrating into cities where sanitation, air quality, housing, and food security are already poor. As slums grow and urban ecological conditions deteriorate, it creates additional impetus for educated and skilled urbanites—who are not themselves directly exposed to the environmental hazards of deforestation—to seek greener pastures overseas in countries such as Canada.

The importance of migrant networks, and access to them, is further developed by Kerstin Schmidt who uses empirical data collected from the Mexican states of Zacatecas and Veracruz. There, Schmidt finds that access to migration networks is far from universal and is instead heavily influenced by economic resources, the local cultural context, individual preferences, and the age and gender of would-be migrants. Under the negative impacts expected to result from climate change, some people might wish to migrate elsewhere but would be unable to do so for lack of access to existing migrant networks. Others, who might have such access, have never sought it out, having no interest in migrating elsewhere, and are unlikely to migrate even if climate change exacerbates the hardships they experience.

The chapters in the first section of the book demonstrate a variety of methodological options for pursuing research into the relationship between inequality and environmental migration. In the second part of the book, we encounter chapters where the authors have reflected in greater detail on particular dimensions of that relationship. Returning to the case of Bangladesh, Ackerly explores further the question of the *invisibility* of the most vulnerable, who often suffer worst when environmental hardships occur. She points out that the inequalities and injustices that characterize the lives of the most vulnerable are *hidden in plain sight*, cloaked by a swirl of social, economic, and political dynamics. Introducing the *3Fs*—familiarity, frequency, and fragmentation—she outlines a methodological agenda for future research that incorporates analysis of environmentally exacerbated social inequalities across multiple scales.

Greiner and Sakdapolrak also draw attention to the under-theorized and depoliticized ways in which environmental migration is too often discussed. It has been common among researchers, policymakers, media, and the wider public to see environmental migration as an emergency response of desperate people, fleeing a location at risk with no prospects of return. Based on their extensive empirical research, the authors point out that migration patterns can be circular over time and geography, and that migration events are not socially discrete events—there are continuous feedback interactions between migrants and non-migrants, origin and destination, and with other sectors of economy and society. The authors describe how a political ecology of translocal relations can assist researchers to generate a more nuanced understanding of how inequality, environmental factors, and migration play out in dynamic fashion.

In the final section of the book, our authors challenge us to think about the larger implications of what environmental migration is, and what it means to be (or be labelled) an environmental migrant. One important consideration is statelessness. Statelessness and the inevitable lack of mobility rights that typically accompany it are a basic form of global inequality. The UNHCR estimates there are presently 10 million stateless people worldwide. Fornalé and colleagues reflect on the situation of small island states threatened by rising sea levels and ask how the international community might assist to protect populations affected by environmental changes. They find that international law lacks any clear measures or guidance on what to do if/when people become stateless because their state ceases to be physically habitable. International law is similarly silent on what rights of migration or mobility people have, if any, if they must relocate to another state for environmental reasons.

Mayer draws us back and asks a fundamental question: What do we mean when we talk about *environmental migration*. If we, the international community, are going to offer assistance and protection to environmental migrants and/or create new legal and governance mechanisms to do so, exactly who are targeting? Mayer notes that in the face of challenging environmental conditions, it may not necessarily be those who migrate (or are considering migration) who are most in need of assistance. Further, are people who migrate for environmental reasons more or as deserving of the international community's attention compared with people who

migrate for other reasons? The author calls for greater rational reflection on questions of how we categorize people and their motivations; the implications of the categories we create; and how creating migration and mobility rights is only one step toward developing the capacities of people who are most exposed to the impacts of environmental degradation and change.

The chapters in this book provide a rich sampling of recent work that encourages greater attention to the ways in which inequality influences environmental migration. This volume is far from being the final word on the subject. Rather, we suggest it offers a useful departure point for future research and policy reflections. In the conclusion, we will look at the directions scholarship will likely take in coming years. We are pleased to offer an afterword by political scientist Chloé Vlassopoulos, in which she considers many of these research challenges based on her experience leading the EXCLIM project that studied management options for populations displaced by extreme climate events. We hope that you, the reader, enjoy what now follows, and that it stimulates you to make your own contributions to this rapidly evolving, increasingly important subject.

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Part II
Empirical Investigations

Chapter 2
Rainfall Variability, Hunger, and Social Inequality, and Their Relative Influences on Migration: Evidence from Bangladesh

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Abstract Research on climate change and migration usually assesses the effects of natural hazards and/or creeping environmental degradation on people's livelihoods and their migration. This chapter looks at changing rainfall patterns, local perception of these changes, and the decision to migrate, or not, to cope with rainfall variability and hunger. Based on empirical evidence from a case study undertaken in Kurigram District in northern Bangladesh, this chapter addresses four key questions: (1) Is the rural population sensitive to rainfall variability? (2) How is rainfall variability related to food security? (3) Which labour-migration systems can be used by the local people to cope with environmental shocks and adapt to change? and (4) Do people migrate for work to cope with and adapt to the effects of

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rainfall variability or because of food insecurity and social inequality? Although rainfall variability can play an important role in people's decisions to migrate, we argue that migration from the region is not driven so much by climate changes as it is by the persistent local patterns of social inequality and food insecurity coupled with the structural economic disparities that exist in Bangladesh.

Keywords Climate change adaptation · Food security · Social inequality · Labour migration · Seasonal migration · Bangladesh migration

2.1 Rainfall Variability and Migration in Bangladesh

Changing rainfall patterns such as an early or late start of the monsoon, an increasing variability of rainfall with altering periods of too much and too little rain, and a general shift in seasonal patterns are an important dimension of climate change and have considerable impact on the people in South Asia (IPCC 2007). In the academic debate about climate change, migration is often discussed as a coping strategy of people who flee before or after rapid-onset natural hazards, such as cyclones or floods, and as a way to adapt to slow-onset environmental changes, such as degradation or sea-level rise (see McLeman and Smit 2006; Warner et al. 2010; Piguet et al. 2011 for an introduction to the terminology). Much of the existing literature on climate and migration in Bangladesh has focused on these two relationships (see Warner et al. 2009; IOM 2010; Poncelet et al. 2010; Piguet et al. 2011; Penning-Rowsell et al. 2011; Mallick and Etzold 2015). While shifting seasons and increasing variability of rainfall can impact people's livelihoods substantially, there has been little study of these in Bangladesh, possibly because changes in seasonal rainfall rhythms can be slight and difficult to assess. It may also be because the impacts on rural livelihoods and food security, and their consequent links to migration and displacement, are not easily established.

Previous research shows that due to the highly contrasting spatial and temporal distribution of rainfall, Bangladeshis often face too much or too little water. An abundance of water during the monsoon leads to seasonal flooding. While in the dry season, high temperatures and little or no rain leads to low water levels in the rivers, causing saline ingress along the coastal rivers, low soil moisture levels, and often creating agricultural drought conditions (Selvaraju et al. 2006). Given the normal seasonal hydrological complexity, a good harvest or a crop loss depends largely on the availability of water in the right quantity and quality, and also at the right time. If farmers are unable to manage the variability in rainfall through adaptations such as irrigation, they risk losing some or all of their production. However, poor subsistence farmers often cannot afford irrigation. Too little water during the critical growing period of their crops increases their food insecurity. If no other employment opportunities are available in the immediate vicinity, migration becomes an

option households use to sustain their livelihoods in the long run, and to secure access to food in the short- and mid-term (Findlay and Geddes 2011; IOM 2010; Poncelet et al. 2010). Studies by Gray and Mueller (2012) show a positive and significant relationship between crop failures (primarily driven by rainfall variability) and long-term mobility in Bangladesh. However, the propensity to migrate permanently due to crop loss and food insecurity differs significantly among rural households. In the case of a severe drought, landless labourers, for instance, do not lose their own agricultural production, but rather their work. They are thus more likely to migrate permanently in search of alternative employment opportunities than members from households who have lost a large share of their harvest, but hope to recover at home (Gray and Mueller 2012). Such studies point to hunger or food insecurity as a key variable that helps explain the complex relationship between environmental changes and human mobility.

In order to understand migration in the larger context of climate change, Findlay and Geddes (2011) suggest a need to first investigate pre-existing mobility patterns and livelihood systems, and then assess the *additional burden* that climate-related risks pose for people. In this context, food (in)security presents three additional considerations. First, it should be recognized that what and how much people (can) eat is a reflection of broader social inequalities within a given society. Second, in rural communities in the global south most people depend directly on environmental resources. They either rely on their own agricultural production for food or they earn their income and food by providing labour on other people's fields. Third, the occurrence of hunger is often an immediate consequence of an adverse environmental event or crisis.

To provide empirical evidence for the complex relationship between environmental changes and migration, a field study was carried out in 2011 in Kurigram District in northern Bangladesh by CARE Bangladesh and the United Nations University Institute for Environment and Human Security (UNU-EHS) as part of the Where the Rain Falls project. The objective of this broad international comparative study—undertaken in eight countries—was to understand the relationship between changing weather patterns, food security, social inequalities, and human mobility (Warner et al. 2012; Warner and Afifi 2014). Our research findings in Bangladesh were documented in a comprehensive case-study report (Ahmed et al. 2012, Etzold et al. 2014). The report addressed four key questions: Is the rural population in Kurigram District sensitive to rainfall variability? How does rainfall variability relate to the people's condition of food security? Which labour-migration systems can be used by the people from Kurigram to cope with shocks and adapt to change? Do people migrate for work to cope with and adapt to the effects of rainfall variability and/or because of the existing patterns of food insecurity and social inequality? Our answers to these questions provide insight into the complexity of the relationship between societal inequality and environmental migration, and contribute to the wider discussion of these issues being considered in this volume.

2.1.1 Study Area and Methodology

Our study focused on the Kurigram District of Rangpur in northern Bangladesh. The majority of the population in Kurigram pursues agricultural livelihoods, meaning that household security is directly dependent on rainfall. The region is known for a high incidence of poverty and seasonal food insecurity during the so-called *monga* period, when rice planted during the rainy season has yet to be harvested. The area is susceptible to monsoon flooding and riverbank erosion and has experienced significant changes in overall rainfall patterns. Within the district, four villages in Kurigram Sadar Upazila were selected because of previous community-adaptation work by CARE. Khanpara, an agricultural-based village of 600 people, was chosen as a base where most interviews and focus-group discussions took place. Three additional satellite villages were selected to generate comparative results: Khamar Holokhana (3800 people), Arazi-Kodomtola (700 people), and Doalipara (1000 people). Most of the people living in these villages are engaged in agriculture—46 % of the working population are farmers on their own land and 30 % are agricultural labourers. The rest are wage labourers or work in commerce and community services (see Ahmed et al. 2012 for more details on the study sites).

Both quantitative as well as qualitative research methods were applied during field research in October 2011 in order to understand under which circumstances households use mobility as an adaptation strategy to rainfall variability. The quantitative data was collected through a structured questionnaire survey involving 150 households. Random sampling was used to select the households for the survey across the four study villages. Qualitative data was collected through 33 focus-group discussions. A variety of Participatory Research Approach (PRA) tools were employed, including a comprehensive well-being analysis, livelihood risks rankings, timelines on agro-ecological changes and migration patterns, seasonal calendars, impact diagrams of rainfall variability, Venn diagrams on food security and migration networks, and mobility maps. In addition, 14 semi-structured interviews were conducted with experts from local and regional organizations involved in agricultural production and socio-economic development (see Rademacher-Schulz et al. 2012 and Ahmed et al. 2012 for more details on the methodology).

Although the triangulation of focus-group discussions, the household survey and expert interviews, as well as previous research and community-adaptation projects by CARE allowed a deeper understanding of the relevant research issues, there were also clear limitations to our study. First, talking about longer climate trends and more recent environmental changes was challenging. For example, the way local people spoke about rainfall variability and their agricultural production seemed to be biased by very recent, negative experiences. Our research took place during the peak of the *monga* season, when many people face acute food insecurity, which may have influenced their responses. Had the interviews taken place after the harvest, it might have yielded different results. In an ideal world, the study would have sampled more sites across northern Bangladesh and included interviews with migrants at their

destinations, not just their family members in the sending communities. However, we were able to include people who had previously migrated and returned.

2.1.2 Findings: Rainfall Variability, Hunger and Migration in Kurigram District

The central purpose of this study was to determine under what circumstances households use migration as a risk-management strategy in response to increasing rainfall variability and food insecurity. In northern Bangladesh, there are several dimensions to this issue. There is a distinct seasonality and thus rainfall dependency of livelihoods, a clear relationship between rainfall variability and food security, and a seasonal rhythm in Bangladesh's internal labour-migration system. Further, it is evident that social inequality and food insecurity in Kurigram combine with structural economic imbalances within Bangladesh to drive migration.

2.2 Rainfall-Dependent Livelihoods and Perceptions of Climate Change

In northern Bangladesh, agricultural production largely depends on natural rainfall because irrigation systems are costly and not common. Therefore, variations in rainfall have a direct effect on food production and household incomes. People are also exposed to increasingly frequent natural hazards which exacerbate the effect of the highly variable rainfall. Erratic rainfall patterns include a bimodal shift of monsoon rains, with two short but sharp rainfall episodes at the beginning (June/July) and at the end of the monsoon (September), and significant dry spells in between (July/August). This shift is made worse by a decline in already scant rainfall throughout the dry season and less reliable occurrences of intensive rainfalls during late-October (the so-called *Kaitan Sato*). For Kurigram District, data shows that while the inter-annual variability of rainfall is increasing, there is conflicting information on the changes in total precipitation. Some data sets show a slight increase of total monsoon rainfall over the past 30 years, others suggest a slight decrease.[1]

[1]The rainfall data from the Kurigram weather station suggests that monsoon rainfall *decreased* at a rate of about 0.55 mm per year (time series 1979–2010; data provided by the Bangladesh Water Development Board). In contrast, analysis of three different databases (CPC-Unified, CMAP, APHRODITE) shows that the total monsoon rainfall in Kurigram District has slightly *increased* over time (time series 1980–2007; data provided by the Center for International Earth Science Information Network, Columbia University).

The local people are well aware of seasonal weather patterns, extreme events, and changes in rainfall because their livelihoods and food security reflect a seasonal rhythm. Residents have noticed a shifting of the seasons. They remember that 20 years ago there were always six seasons but now they can identify only three or four distinct seasons in the year. Changes in rainfall patterns disrupt agricultural practices that have been learned and applied for generations and are thus perceived as severe livelihood risks. More erratic rainfall patterns have been observed by the local population since the early 1980s. Ninety-six percent of the respondents in the survey noted an increase in dry spells and droughts, and 84 % reported an increase in extreme weather events such as cyclones. Too much rain might result in excessive instead of normal flooding, whereas too little rain leads to more dry spells and prolonged droughts. One woman in Khanpara commented on an unexpected dry spell during the 2011 monsoon season and compared it with her experience of the past: "Back then clouds gathered in the sky and rain dropped, but now we can see clouds in the sky, but no rain falls."

An increasing variability in rainfall has implications for the vegetative cycle of crops such as Aman rice, Boro rice and wheat, for the abundance of fish in ponds and rivers, and thus for the overall availability of food and the need for labour. Erratic rainfall patterns have brought a different dimension to people's vulnerability that complicate and exacerbate the livelihood problems of people living in poverty.

2.3 Changing Rainfalls—Increasing Hunger?

In Bangladesh, food production and food imports have increased steadily over the past 30 years. Sufficient amounts of food are *available* on the markets to feed the nation's growing population, but food insecurity is nonetheless one of Bangladesh's most pressing problems (GoB and WFP 2004; Zingel et al. 2011; Keck et al. 2013; Keck and Etzold 2013). Food insecurity is a manifestation of economic and social inequality as people in poverty do not have adequate *access* to food (Ingram et al. 2010). In Kurigram District, rice yields have increased substantially due to the implementation of high-yielding technologies. However, many small-scale farmers simply cannot keep up with the rising costs of production. Indeed, these farmers cannot produce enough food to feed themselves and their families throughout the year. As a result, they rely on local labour opportunities to earn extra cash-income to buy food, which exposes them to fluctuations in food market prices. Each year, from mid-September to mid-November, agricultural wage labourers and small-scale farmers face a period of hunger (the *monga* season) as little labour is required on the fields before the actual harvest of Aman rice, the most important crop in the region. During this time of low income, many families are forced to reduce their consumption of food and go hungry (CARE 2005; Zug 2006). In Kurigram District, food insecurity is a chronic problem for people living in extreme poverty, who can go hungry any time of the year. During the *monga* in 2011, three-quarters of the interviewed households faced acute food insecurity.

Since rainfall patterns shape local food production, greater variability of rainfall has significant implications for rural communities particularly the food security of poorer families. Almost 90 % of the surveyed respondents reported negative effects of rainfall variability on their livelihoods—whether directly through their own food production or indirectly through higher food prices. Rice is the staple food for millions of people in Bangladesh. Food security can then largely be understood as *cereal security*, which depends on people's own rice harvest (availability of food), the local availability of labour to earn cash income to purchase rice, and the market prices for rice (access to food). Since Aman rice is grown in rain-fed conditions, too much or too little rain during the monsoon and the *Kaitan Sato* period can severely affect Aman production.

About 80 % of farming households in the study cultivate rice for subsistence only. Because the poorest families have only small landholdings and cannot afford irrigation or other investments, a decline in productivity has a direct impact on their food security. In Kurigram, three-quarters of the respondents buy most of the food they consume from local markets. Almost two-thirds of all respondents stated that they had experienced temporary food price increases when production declined unexpectedly due to too little or too much rain. Wage-labour dependent families are hit harder by such temporal increases of food prices than are farming households, who produce more of their own food.

If too much rain falls at an unexpected time and triggers floods, crop damage or temporary disruptions in the labour market, the vast majority of households (69 %) cope by reducing their food consumption. Half of respondents rely on external resources to access food during these critical times. This includes food aid by the government or NGOs. One-third of respondents reduce their expenditure on other goods to reallocate their spending on basic food requirements. One-fifth of households rely on remittances from migrant family members to secure money for food. Others sell assets, such as land or jewellery, and/or seek to increase their income through employment in the local labour market. If people cannot cope (in the short-term) or adapt (in the long-term) to further production loss and food price increases, food insecurity is exacerbated and the annual period of hunger is prolonged.

2.4 Seasonal Labour Migration: Moving Away from Hunger

Migration is used as a way to avoid or reduce food insecurity by 79 % of respondents to our survey and is part of broader income-diversifying activities for 27 % of respondents. Roughly 43 % of the households who responded had members who were not present due to temporary or permanent out-migration. Ninety-seven percent of the migrants were men. Although the number of out-migrants from the four studied villages has increased significantly over the past decades, this should not

obscure the fact that the vast majority of the people in Kurigram District are not mobile. Eighty-eight percent of the interviewed people in our survey have never migrated themselves, especially the elderly, people in extreme poverty, Hindu fishermen, and women.

Why Do People Migrate? According to our survey, the major reasons to migrate can be ranked as follows: poverty and lack of employment opportunities in the home region, food insecurity, rainfall variability, and natural hazards. Rainfall variability or other hazards are not the proximate cause of migration; rather, it is their immediate and mid-term effects, most importantly crop loss, local unemployment or food price hikes (Gray and Mueller 2012; Black et al. 2013; Martin et al. 2013). More than half of the respondents indicated that a sudden decline in crop production after a natural hazard or a dry spell during the monsoon season is an important reason for out-migration. One elderly woman remarked, "In any incidence of hazard, if we lose [food] production we have hardly any alternative but to migrate." In general, dry spells, shifts in seasonal patterns of rainfall, as well as floods and storms were each seen by around 40 % of respondents as important reasons to migrate. Lack of available land for cultivation, a decline in animal production and fish catch, as well as poor soil quality and generally unreliable harvests—each of these relate to the local availability of food—were also mentioned as important reasons to migrate. Increasing food prices—the key indicator for people's access to food—was in turn seen as an important migration motive by one-third.

Where Do People Go? Labour migration from the Kurigram District is almost solely in-country migration.[2] Most studies on migration in Bangladesh focus on rural-to-urban migration, in particular to the megacity of Dhaka. In our study, 49 % of the movements were to urban centres, while rural-to-rural migration accounted for 47 % of all movements (see Fig. 2.1 for a map of the major destinations). Generally, members of more affluent households are less inclined to migrate. If they do, they migrate to urban destinations, either for secure employment in the formal economy or for higher education. Most migrants, however, are people with little or no land to cultivate. In the cities they can find work in the garment industry, the construction sector, or in the urban informal economy if they possess the necessary skills and can adjust to the higher cost of living. Many migrants from Kurigram, however, temporarily move to other rural destinations such as Munshiganj, Feni or Comilla, where they can take advantage of their agricultural skills and benefit from the demand for labour during the sowing and harvesting season of rice or potatoes. Many migrants have established close ties to employers in these agricultural regions. *Sadars* (migration entrepreneurs) help organize these *labour journeys*, negotiate wages with employers, and facilitate transport, accommodation, and food for groups of labour migrants. Access to such networks means a more secure migration, which is an important consideration. As a consequence, an agrarian

[2]There was only one international migrant in 150 households in the survey, and none among the 118 households in the wealth-ranking in the base village.

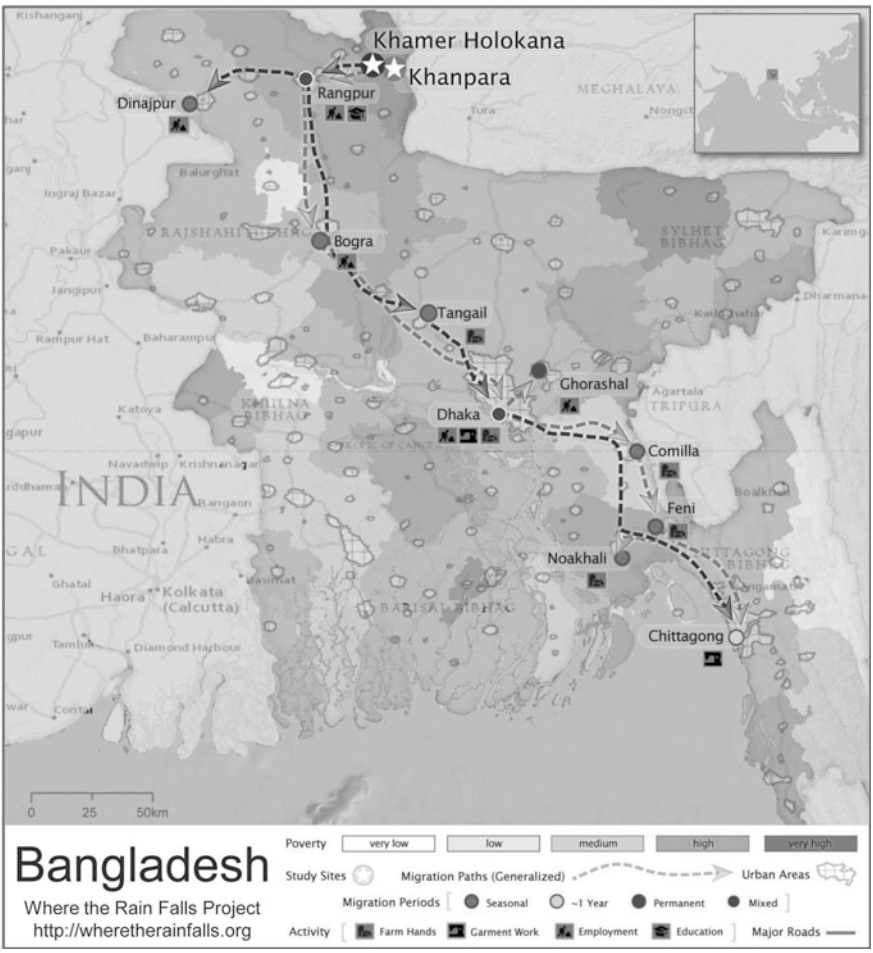

Fig. 2.1 Migration pathways of study sites in Kurigram District and key indicators of rainfall variability in Bangladesh. *Source* Modified from Ahmed et al. (2012, p. 142) (See http://wheretherainfalls.org/ for an interactive and coloured version of the map with different background information.)

labour-migration system has evolved between Kurigram District and prospering agricultural regions like Munshiganj, near Dhaka, or Feni. Depending on the availability of work and the wages on offer, the labourers move back and forth between these places several times a year. Their livelihoods have thus become *translocal* (Peth and Birtel 2015).

When Do People Migrate? There is a distinct seasonal rhythm to labour migration from Kurigram. Despite the seasonality of hunger, migration seems to be driven by *pull factors*, rather than *push factors*. Most people do *not* migrate during the peak food-insecurity period since there are few employment opportunities in

agriculture in other places at that time. Soon after, however, the opportunities to migrate to Munshiganj or Feni, for instance, improve as the Aman crop matures there and the harvest requires extra labour (late November and December). Between February and April, migrants do *not* leave because of acute food insecurity in Kurigram, but rather because of the temporary high demand for wage labourers in Dhaka's garment industry or in the wheat and rice fields of Munshiganj and Feni. There is little evidence that migration is used as a planned, long-term adaptation strategy to diversify risks and to raise the family's income level. Instead, migration seems to be an adaptation to the shifting seasonal requirements of a domestic labour market that is structured by the annual monsoon cycle, by capital investments in agriculture elsewhere in the country, and by consumer demands in the global fashion industry that drive production in the garment factories of Dhaka (Kabir and Seely 2008; Ahmed et al. 2012; Peth and Birtel 2015).

What Are the Benefits of Migration? Labour migrants contribute significantly to the economy and to social transformation in Kurigram District. In the focus group discussions, it was often said that without the money sent back by migrants, many households could not maintain a basic supply of food. Three-quarters of all migrants' remittances are spend on food consumption. The migrants—regardless of whether their move is permanent, seasonal or temporal, or whether they move to or circulate between cities, other rural areas or international destinations—work hard for a gradual improvement of their families' lives and their food security. Nonetheless, labour migration also entails distinct social costs for those who are temporarily left behind. Because the men migrate alone in most cases, the women back home shoulder an even greater workload, are often burdened to pay back debts, are even less food secure, and sometimes face social and sexual harassment in their husband's or father's absence (Ahmed et al. 2012).

2.5 Social Inequality, Hunger, and Migration Choices

Labour migration from northern Bangladesh takes place within existing social networks and within established labour-migration systems. But who migrates in the context of rainfall variability and food security? To answer this question, one needs to bear in mind the inherent social inequality in the communities. According to the participants in a wealth-ranking exercise, a household's class or poverty status depends on land ownership, material possessions, sources of income and labour relations, and food security. These factors help to explain the social differentiation in the migration process.

Wealthier families who have large agricultural farms are also exposed to rainfall variability, but they are not as sensitive to the variability because they have alternative sources of income outside of farming. Because they are not subject to food insecurity, they do not need to migrate to sustain their livelihood. But they—or their children—do migrate for education or for formal employment. In Khanpara, 31 % of wealthier households had migrants in their family. All migrants were men and all

were living in cities. For this group, migration contributes to a further diversification of livelihood risks and an attainment of a higher social status.

Members of the *middle class* directly depend on rain-fed agriculture and are exposed and sensitive to rainfall variability. They are not food-secure year round and have to deal with seasonal food insecurity. In Khanpara, 41 % of middle-class households had migrants in their family. Five of the 26 migrants were women—two of them had left for education. Twenty-one of the 26 migrants worked temporarily in urban areas—mostly in the garment industry. An additional three had left temporarily to work in agriculture in order to cope with food shortages. And only two in this group from Khanpara had permanently migrated. Environmental stress such as a dry spell during the monsoon can surpass the adaptive capacity of these middle-class households and push them back into poverty and hunger. Successful migration allows them to diversify their livelihoods and increase their resilience to environmental risks. Either way, if the variability of rainfall increases, migration becomes an even more important risk-management strategy for them.

The *poor class* is most sensitive to rainfall variability because most are agricultural wage labourers. Some families have their own harvest, but the amount is usually too small to meet their food demand. During the pre-harvest *monga* season, the availability of work in the neighbourhood is low and they have trouble earning enough money to buy sufficient food. In Khanpara, 49 % of these poor households had migrants in their family. No women were among the migrants. Eighteen out of 29 migrants, mostly the male heads of their respective households, temporarily worked as wage labourers in other agricultural areas. Seven temporarily worked in cities as rickshaw pullers or garment labourers. Temporary rural-urban or rural-rural migration during or just after the monga season helps these poor families cope with food insecurity/scarcity. Their overall situation of dependency and seasonal insecurity, however, remains the same. A further increase in rainfall variability in northern Bangladesh will negatively affect the local labour markets, if no alternatives to agricultural labour are developed. Given a higher demand for labour in other parts of the country, the number of migrants from this group is likely to increase.

Extremely poor families are not as sensitive to changes in rainfall variability, because most of them are not actively involved in agriculture. They do, however, have to live with food insecurity year round and they seldom get three meals a day. During the annual *monga*, their *coping strategies* are stretched to the limits; some face starvation. In Khanpara, only two of these extremely poor households (i.e., 13 %) had migrants in their family. Both migrants were sons, who worked as day labourers in Dhaka. Families living under conditions of extreme poverty do not benefit from migration to cope with hunger or to improve their situation in the longer term. They don't have adult male family members who could work as labour migrants, the necessary resources to facilitate migration, nor the access to migration networks. These *trapped populations* (Poncelet et al. 2010; Black et al. 2013) are forced to adapt to the adverse effects of increasing rainfall variability with the resources that are locally available to them.

2.6 Conclusions: Social Inequality, Food Security, Rainfall Variability and the Role of Migration

Our research fills a gap in the existing literature on environmentally-induced migration in Bangladesh by examining how the variations of normal rainfall patterns affect livelihoods, food security, and migration decisions. The migration outcomes in the study area are influenced by a complex interplay of climate variability, seasonal food insecurity, social inequality, and structural factors beyond the influence of households.

Due to the rainfall dependency of agriculture-based livelihoods, significant changes in the annual monsoon cycle—too much or too little rain at unexpected times—are perceived by the local people as livelihood risks. The rural population is sensitive to rainfall variability patterns, although different social groups depend on agriculture to a different extent. Rainfall variability and food security are closely intertwined. An atypically long dry period during the monsoon season can lead to crop damage and to reduced food production. This will then contribute to an increase in food prices and reduce the demand for agricultural labourers throughout the harvest season. As a consequence, small-scale farmers and dependent wage labourers must reduce their own food consumption to cope with the effects of rainfall variability or seek alternative income sources by migrating for work opportunities.

The ebb and flow of Bangladesh's internal labour-migration system is driven by the demand for agricultural labourers and informal workers, and is influenced by the seasonality of hunger in northern Bangladesh. When rainfall-sensitive livelihoods in Kurigram District are negatively affected by too much or too little rain at the wrong time, some households can make use of existing migration systems to cope with such a temporary crisis. There is, however, a significant lag between the time when people are most food insecure and the time when there is a high demand for their labour. During these critical weeks, it is important that affected families have savings or assets they can sell, access to loans from shop owners or money lenders, or access to food aid and institutional support from the government or NGOs.

Migration is a process of social differentiation. In the study area as elsewhere, people's capital and capacities, as well as their social networks, structure their migration opportunities. The simplistic class analysis we have described shows that persistent local patterns of social inequality and food insecurity have an impact on different social groups' propensity to migrate in response to rainfall variability. The most affluent and food-secure people do not *need* to migrate in order to adapt to the negative effects of rainfall variability, because their livelihoods are resilient. In stark contrast, the poorest and most food-insecure people *cannot* migrate. These most vulnerable *trapped* households are forced to stay and cope with rainfall variability. For the social groups in between these extremes, permanent, seasonal and/or temporary labour migration is a way to adapt to climate risks and environmental change. Some households actually advance socio-economically because of migration, which has led to a diversification of their livelihoods and a reduction of their

sensitivity to rainfall variability. Members of other households migrate to cope with the immediate effects of rainfall variability but are just getting by and can neither get out of poverty nor reduce their sensitivity to rainfall variability. Some households use migration to deal with the worst periods of hunger. But their overall situation and the conditions for those left behind actually deteriorate (see also the household profiles by Warner and Afifi 2014).

There are clear links between rainfall variability, agricultural-based livelihoods, people's food security, and migration, but these links are not straightforward. The four questions we raised in this chapter lead us to the following conclusion: Migration in Kurigram is not caused by rainfall variability. Instead, migration is the product of the combined influences of social inequality and food insecurity in the region; structural economic disparities within the country; and the differential in labour needs between more remote rural areas on the one hand, and the major urban centres and prospering agricultural regions on the other. It is of course important to recognize that existing climate variability and the future impacts of anthropogenic climate change will have significant implications for Bangladesh and the migration processes and patterns that take place there. However, this should not obscure the fact that rural Bangladeshis experience multiple livelihood risks on a daily basis. Their lives are fundamentally shaped by social and economic inequalities, and by the political power-games that are played by powerful elites—sometimes even in the name of climate-change adaptation.

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Chapter 3
Shifting Rainfalls, Shifting Livelihoods: Seasonal Migration, Food Security and Social Inequality in Northern Ghana

Benjamin Schraven and Christina Rademacher-Schulz

Abstract This chapter examines the interrelationship between rainfall variability, migration, and social inequality in a savannah district of Northern Ghana affected by environmental change. The analysis shows that seasonality is a crucial factor shaping smallholders' livelihood decisions in semi-arid Northern Ghana, an area characterised by a unimodal rainfall. This pattern of rainfall allows one half-year rain-fed production cycle only. Seasonal migration is an important strategy in response to temporary food shortages, which are exacerbated by environmental and climate change. Study results show that the traditional migration during the dry season has increasingly shifted toward the rainy season—especially among poorer and vulnerable households. Rainy-season migration reduces the farm household's labour availability, which in turn leads to reduced crop yields and lower food security. Interviews with local people reveal that most migrants perceive rainy-season migration to the mining sites (*galamsey*) of Ghana as more promising than rain-fed subsistence agriculture at home despite the severe dangers and likewise uncertain outcomes associated with *galamsey*. Only if migrants can remit, do they compensate for their absence during the main time of farm activities at home. Otherwise, households face the risk of increased food insecurity and vulnerability. A majority of migrants, however, prefers non-agricultural professions and some have already invested in these activities. Thus, the temporal shift in seasonal migration leads to a significant shift in livelihood preferences among the poorer and highly vulnerable households, and a concomitant reduction of the importance of subsistence agriculture for the local population.

Keywords Seasonal migration · Subsistence agriculture · Food security · Social inequality · Ghana

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3.1 Introduction

In the academic debate on the linkages between environmental change and human mobility, migration is increasingly understood as an important response to manage the adverse effects of ecological change. Moreover, when perceived as a response to poverty, social marginalization, and global environmental change, migration serves as a means to reduce vulnerability and increase livelihood security (Tacoli 2009; Black et al. 2011; Scheffran et al. 2012; Faist and Schade 2013). However, it is not the permanent migration of whole families or households that makes human mobility an essential response to climate change, environmental degradation or poverty. Time-limited forms of migration, which are primarily undertaken by individual family members, are most common in this regard. And seasonal migration plays a key role (Foresight 2011; Warner and Afifi 2014; Jaeger 2009).

In the overall debate on climate change and adaptation, there is a strong focus on the processes of coping and adaptation. Generally speaking, coping strategies refer to short-term livelihood reactions to unplanned or unforeseen crises following sudden events like floods. The reduction of food consumption and the sale of household assets are examples of such strategies. In contrast, adaptation refers to deliberate and long-term oriented adjustments of livelihood strategies in anticipation of—or in reaction to—external stimuli and stress, such as increased rainfall-variability (Nelson et al. 2007). Risk diversification and the establishment of new income sources via labour migration are typical adaptation strategies (Ellis 2000). Although coping strategies might undermine people's food security and erode their livelihoods (Cannon and Müller-Mahn 2010), it is an oversimplification to view coping strategies as unsustainable and adaptation strategies as sustainable. The adaptation debate is increasingly criticized for having a static perception that does not adequately take into account transformation processes in the context of societal change, profound changes of livelihoods or social mobility (Keck and Sakdapolrak 2013). Adaptation strategies promoted for those in the smallholder agricultural sector range from the implementation of crop-failure insurance to the installation of water-storage facilities. But these strategies are largely based on development pathways to which a smallholder does not have access. Livelihood transformation or social mobility processes leading out of smallholder/peasant agriculture are widely excluded in the debate. Cannon and Müller-Mahn (2010) perceive the current adaptation discourse as a threat to the prospects of poor countries' development and demand an integration of development and climate-change adaptation-related efforts under the joint umbrella of pro-poor policies.

In Ghana, internal seasonal migration, especially from the poorer northern savannah areas to the economic centres of the tropical south, has been an important mobility pattern since early colonial times. It also has been an important strategy to deal with environmentally or otherwise induced food insecurity (Anarfi et al. 2003). This chapter is based on a case study in Nadowli District, Upper West Region in

Ghana,[1] which is characterised by increasing rainfall variability and decreasing soil fertility—like most other parts of Northern Ghana. We will explore the dynamics between environmental change and the current manifestations of seasonal migration, and how these factors interrelate with social inequality and the changes in livelihood preferences.

The case study used a mixed-methods approach, consisting of a household survey[2] (n = 158), participatory rural approaches (PRA), and expert interviews. The livelihood situation was investigated in four rural communities—Takpo, Nanville, Zupiri, and Mantari (Rademacher-Schulz and Mahama 2012). A follow-up study, consisting of 32 qualitative interviews, was conducted in April and May 2013.

3.2 Northern Ghana Between Socio-economic Disparities and Environmental Change

In the early 20th century, the British colonial administration widely neglected the northern regions of today's Ghana. Colonial officers perceived the savannah areas of Northern Ghana as a *wasteful* possession that had no developmental prospects and at best could serve as a labour pool for the economy of South and Central Ghana. In the first half of the 20th century, the cocoa and mining industry in the south expanded steadily (Sutton 1989). The unequal treatment of the north by the colonial administration and post-independence governments manifested itself as a significant north-south divide in terms of poverty and other development-related indicators. According to the Ghana Statistical Service, 28.5 % of the Ghanaian population lives in poverty and 18.2 % in extreme poverty. However, poverty rates are unequally distributed among Ghanians. Less than 22 % of the whole country's population live in the three northern regions (Northern Region, Upper East Region, and Upper West Region), but half of its poor and 80 % of its extremely poor are residents of the north (Pickbourn 2011 [46]). Likewise, Northern Ghana notably lacks such things as healthcare facilities, transportation infrastructure, and access to water, sanitation, electricity, and housing.

The case study was conducted in Ghana's Upper West Region. Like most parts of Northern Ghana, it belongs to the West-African Guinea Savannah belt. In this ecological zone, the climate year is characterised by one wet season (traditionally

[1]Based on the country's case study of the Where the Rain Falls project http://whereterainfalls.org/.

[2]The unitary or homogenous household model, which was dominant in the economic research until the 1990s, implies that individual household member's choices are determined by the strategic goals of the household as a whole. This model has been replaced by a more heterogeneous household model with different members, individual goals, and individual economic spheres. Nevertheless, farm households are still perceived as a common board of consumption. Accordingly, the household was chosen as the major unit of analysis for this study.

from late April/early May to October with a peak in August) and one dry season (from November to late April/early May). Historical weather records from Wa (UWR) show that the second half of the 20th century and the early 21st century were characterised by an average annual rainfall of 1036 mm. A clear trend toward decreasing annual rainfall amounts can however not be observed in this region. But there are indications of rainfall variability as more than 90 % of the survey participants reported changes in the rainfall patterns over the last two to three decades. They noted an increased delay of the start of the rainy season, although the start of the dry season remained relatively constant. Furthermore, the participants observed an increase in the duration of intra-seasonal dry spells as well as an increase in the incidence of extreme rainfall events during the wet season (Rademacher-Schulz and Mahama 2012). These observations are confirmed by agro-meteorological data. According to Laux (2009 [130]), regional climate-change models predict a moderate increase in precipitation with high local variation, a shift in the onset of the rainy season, and an increase in dry spells for the next three decades. These trends include an increasing probability of extreme rainfall-related events, such as storm rainfalls leading to floods and droughts (van de Giessen et al. 2010).

These phenomena are putting pressure on the food security of the local population, whose majority (more than 80 %) is engaged in subsistence agriculture using traditional farming methods. Ninety-two percent of the households interviewed report a decline in crop yields, which severely affects the overall economic well-being of the households. Because animal production is also declining, the traditional *safety valve* of selling livestock in times of need to buy food is also under pressure. Furthermore, respondents report that food prices are constantly rising. From this it follows that household food security is at stake, particularly during the so-called *lean season* between May and August when food stocks are diminishing and the first rainy-season grains are not yet harvested. More than 80 % of interviewed respondents said that, in the past 5–10 years, they had experienced (severe) food shortages (Rademacher-Schulz and Mahama 2012) (see Fig. 3.1). Although the majority of the peasant population in Northern Ghana is socio-economically homogenous, different levels of wealth exist. And it is these differences that determine the degree of suffering experienced as a result of food shortages (Laube 2007).

Social and climate factors are not the only cause of food shortages. Environmental, economic or technical factors can also contribute to local food insecurity. These include low soil-fertility rates, poor road infrastructure, absence of non-agricultural employment opportunities, lack of access to modern farming technologies, and poor health of local livestock. Besides selling livestock, local farm households have developed both short-term coping strategies and longer-term adaptation strategies to deal with the temporary food shortages. The range of strategies available to a household threatened by food insecurity is in turn determined by the socio-economic status of the affected household. These strategies could be the sale of household assets, a reduction in the daily food intake during the lean season, modifications to crop production and—last but not least—seasonal migration.

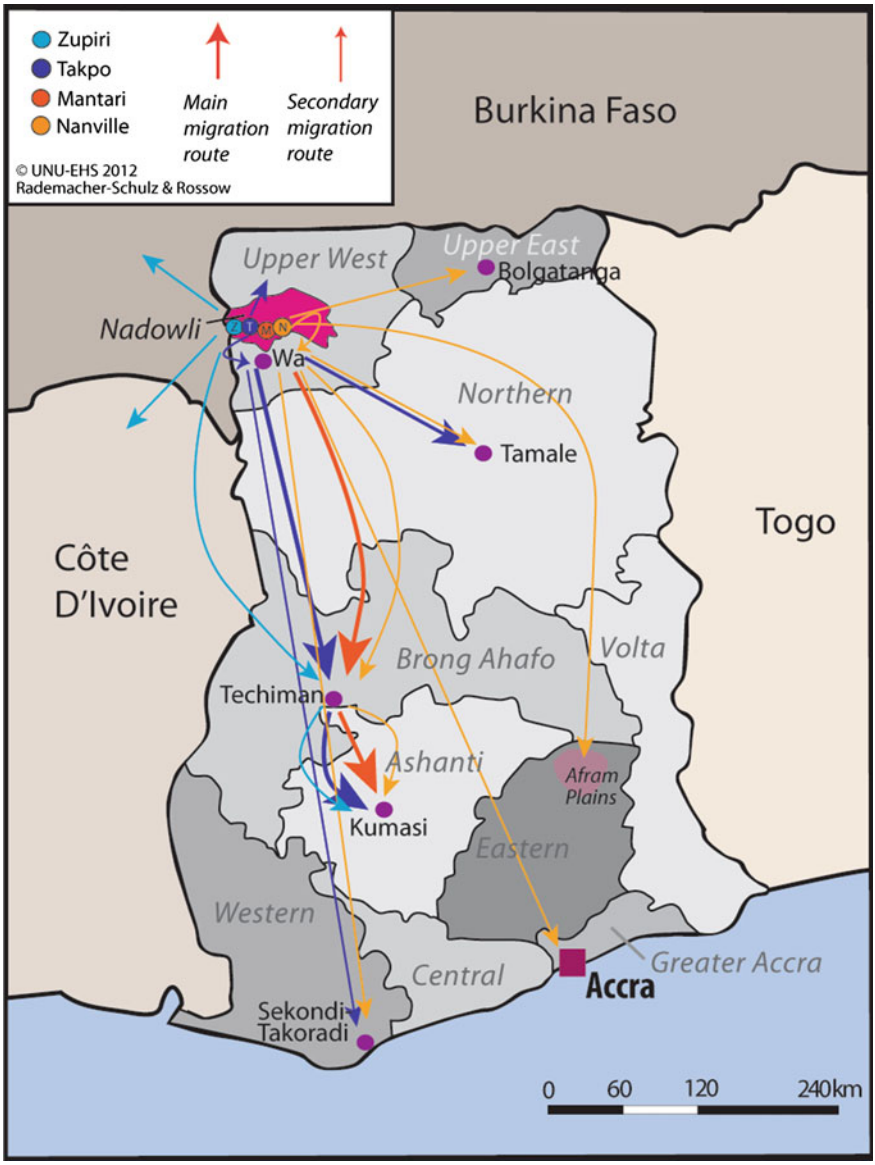

Fig. 3.1 Migrant destinations for the four researched communities in Nadowli District, Upper West Region. *Source* Household survey, 2011 (Rademacher-Schulz et al. 2014)

3.3 Significance of Seasonal Migration in Northern Ghana

Migration in Ghana is a familiar phenomenon. Over time, different forms of human mobility have evolved including both internal and international migration. In colonial times, the development of cocoa farms and gold mines in Southern Ghana attracted many northerners. With the support of the colonial administration, a dry-season north-south migration pattern developed which gained even more importance after independence in 1957. Since the 1990s, migration patterns have diversified as rural-to-urban migration has become more prominent and the independent migration of women and girls has increased (Anarfi et al. 2003; Awumbila et al. 2014).

Migration in its seasonal and more permanent form is a vital characteristic of people's lives in Northern Ghana. In an effort to diversify income, migration is a common means to overcome the limited local non-farm opportunities and to deal with the vulnerabilities related to rain-fed agriculture. Seasonal migration in particular contributes to food security. Migrants bring home money and food, they contribute to the household food production, their seasonal absence reduces the pressure on food stocks during the lean season, and in years of drought, seasonal migration is an important coping strategy for gaining access to food. According to van der Geest (2011), many farmers perceive their environment as "one in which food and livelihood security cannot be attained by farming alone, and in which seasonal migration is a necessary way to supplement what is produced at home" (2011 [605]).

For the Dagara in the Upper West Region, migration to Central Ghana—particularly the Brong-Ahafo Region (Codjoe 2006; Abdul-Korah 2007)—became increasingly important in the 20th century. In the 1930s and 1940s, many young men left because migration trips were largely perceived as adventurous experiences that provided young people the opportunity to escape social control in their home villages. They also got to see the *city lights*, which was related to the colonially induced image of northerners as savage or backward. In later decades, economic aspects of migration decisions became more important and seasonal migration became even more prominent (Abdul-Korah 2008). Since the 1950s, each year during the dry season, a large proportion of the population has migrated south to work as seasonal farm labourers. The south offers more favourable conditions for agriculture because it has two agricultural seasons, fertile land, and work opportunities in commercial plantations. For those who intend to stay longer, there are also leasehold arrangements (Luginaah et al. 2009). While labour demands peak in the middle belt, there are few employment opportunities in the home communities during the dry season (van der Geest 2011). Nevertheless, there are some indications that the conditions for north-south migration are deteriorating. Migrants report that increased mechanisation in commercial agriculture is leading to fewer jobs and labour exploitation. There are also problems finding accommodation and managing living costs (Amegashitsi 2009). Despite these challenges, most migrants still remit

food and money to their families to help cope with food insecurity, and they return home to work on the family farm during the rainy season. For these reasons, seasonal migration continues to be viewed positively. The negative perceptions of seasonal migration include health implications (i.e., sickness or the spread of disease), social implications (people return with *bad* habits), and economic implications (migrants don't return, which reduces the local labour force in the rainy season) (Schraven 2010; van der Geest 2011).

Migration flows from the study area reveal a dominant seasonal rural-to-rural migration pattern. The main destinations for migrants from Nadowli District are Brong-Ahafo and the Ashanti region in Central Ghana (Fig. 3.1). Economic activities of migrants mainly include farming (52 %) and mining (14 %), as well as some trading, civil employment, and domestic jobs. These findings are in line with research results from van der Geest (2011), who worked in the neighbouring Dagara community of Nandom, UWR.

3.4 Interrelationship Between Social Inequality, Food Insecurity, and Seasonal Migration

According to national statistics, the Upper West Region is the poorest part of Ghana. All households in our study area were found to be considerably below the international poverty level of 1 USD per person/day. In the Upper West Region, the mean annual income per person is 106 GH Cedis—about 66 USD per year or 0.18 USD per day. However, the national average in Ghana is nearly four times higher at 397 GH Cedis per year (Ghana Living Standard Survey 5 2008).

Despite the fact that nearly all households in the Upper West Region live below the poverty line, the economic situation of households in the Nadowli District is not homogenous, and social and economic disparities exist. To assess the economic status of a household using the household survey data, a wealth indicator was created using a livestock[3] and an asset indicator.[4] The quantity of each item owned was multiplied by its virtual market price[5] then aggregated. The analysis revealed that wealth differences among the households interviewed was pronounced, especially when female-headed and male-headed households were compared (see Table 3.1). Although gender roles have been changing over the past decades in Northern Ghana (Abdul-Korah 2011), gender remains a determinant for livelihood options—mostly to the disadvantage of women. It is still more difficult for women to access additional farm land apart from the family plots. Furthermore,

[3]Based on the possession of cows, pigs, goats and sheep.

[4]Based on the possession of motorcycles, bicycles, tractors, water storage basins, and mobile phones.

[5]Based on the underlying assumption that the relative prices amongst the selected items and animals in Northern Ghana have remained stable (Schraven 2010).

Table 3.1 Comparison of female-headed and male-headed households

	Female-headed households	Male-headed households
Number (%)	19 (12 %)	138 (88 %)
Dependency ratio[a]	Higher (156)	Lower (86)
Main economic activities	Petty trading, farming, migration, pito brewing[b]	Farming, migration (farming and mining)
Wealth indication[c]	Lower (37.8)	Higher (60.6)
Food security (mean)[d]	Lower (3.1)	Higher (2.6)
Land possession (mean, acres)	Lower (4.4)	Higher (60.6)

Source Household survey, 2011

[a]The ratio was calculated based on the number of children (aged 0–14) and elderly people (65+) divided by the rest of the household members, multiplied by 100

[b]Pito is a locally produced millet beer

[c]It consists of a wealth and livestock indicator

[d]Based on the survey: number of food-insecure months

female-headed households are often households where the husband has died or is staying away for a long period of time. The labour force potential of these households is therefore much lower than male-headed households (Laube 2007).

Because most households in the study area rely on rain-fed subsistence agriculture for their main source of income, their food-security status is dependant on the favourable distribution of rainfall during the rainy season. Figure 3.2 shows the responses of survey participants regarding the distribution of food-insecure months compared to the mean monthly rainfall data.

During and after harvest time in autumn and winter, households have enough food stocks. During the crop growing period though, most households run short of food. This lean season is referred to locally as *nadibo*, which means "what shall we eat?" One of the major coping strategies to overcome food shortages is seasonal migration, which is normally practiced during the dry season, a period when not much work can be done at home. A common statement related to food-security issues, given by an aged household head from Nanville, is "My children need to supplement household food needs by migrating to find money."

Interestingly, the survey analysis does not reveal any correlation between the level of a household's living standard and seasonal migration. But when taking into account the departure time of migrations in 2011, a correlation between food insecurity and migration during the rainy season can be found. During the dry season 2010/11 (November–March), one third of all migrants departed, and during the 2011 rainy season (April–October), two thirds of all migrants left. This is striking because it suggests a change in seasonal migration patterns. This was confirmed by participatory rural appraisal exercises. Interestingly, rainy-season migration is seldom mentioned in the literature on Northern Ghana (Rademacher-Schulz et al. 2014).

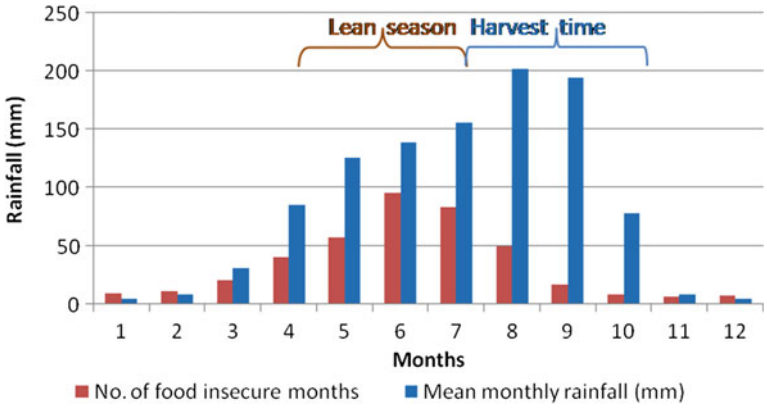

Fig. 3.2 Number of food-insecure months and mean monthly rainfall. *Source* Household survey, 2011 and rainfall data from Wa climate station (1952–2011)

Table 3.2 Characteristics of dry and rainy-season migrants' households (HHs)

	Dry season migrant's HHs	Rainy season migrant's HHs
Sex distribution	3/4 male, 1/4 female	3/4 male, 1/4 female
Generation	Sons or daughters	Sons or daughters
Main economic activities	Farming, mining	Farming, mining
Students	Higher (35 %)	Lower (5 %)
Wealth indicator	Higher (53)	Lower (44)
Food security	Higher (3, 1)	Lower (2, 3)
Goats possession (mean)	Higher (13)	Lower (6)

Source Household survey, 2011 (see Rademacher-Schulz et al. 2014)

The comparison between dry-season and rainy-season migrants' households (Table 3.2) clearly shows that rainy-season migrants' households are generally poorer, suffer more from food insecurity, and perceive their *safety valve*, which is livestock (expressed here by the number of goats), as depleting. They therefore can no longer rely on selling animals to buy food and instead opt for rainy-season migration. Migrants primarily go to the cocoa- and maize-belt zone which has a high demand for labour between April and October. However, this coincides with a time that labour is needed on the farms in their home community. In this way, these households jeopardize their next year's food security by migrating during the rainy season.

To better understand the overall situation of households, analyses of rainfall distribution and crop production for 2011 were undertaken. 2011 was characterised by a negative rainfall anomaly (an unfavourable distribution of rainfall interspersed with several dry spells) and by a significant drop in sorghum and groundnut production (Rademacher-Schulz et al. 2014 [3–4]). The usual strategies invoked to

satisfy immediate food needs, such as selling the cash crop groundnuts and livestock, were thus not available for many households.

The primary motives for migration during the rainy season are twofold. Some households have an acute need for income to buffer household food shortages, which can be labelled an *ex post* coping strategy. Other households, which are anticipating a bad harvest and resultant incomes losses, try to head off a future crisis situation, which can be labelled an *ex ante* risk-management strategy (Ellis 2000). For poorer sections of the population, seasonal migration functions mainly as a survival strategy. Poorer households have to use part of their income from seasonal migration to buy food, whereas better-off farm households are likely to use remittances for investments and non-food consumption (see van der Geest 2011 [606]).

3.5 Perceptions and Aspirations of Migrants in a Changing Context

In addition to the survey and PRA sessions, 32 qualitative interviews were conducted in April and May 2013 with migrants who had gone south during the previous rainy season or during the past years. Thirty-one of the migrants interviewed were male and only one was female, and the average age was 26 years. Most of these migrants did informal gold mining—*galamsey*—in the Ghanaian middle belt during their rainy-season trips. A minority was involved in farming or other economic activities during their stays.

In response to questions about why they migrated during the rainy season, more than half mentioned the economic prospects for doing *galamsey* during that time are better than during other times of the year. Only nine migrants stated that they went during the rainy season because their respective households were running out of food. Four respondents said that they had left during the dry season but simply did not have enough money for the transport back home at the beginning of the rainy season. The remaining two respondents indicated that they stayed in the south due to family responsibilities in the destination areas. When asked about the overall benefit of migrating, 18 respondents stated that it would have been better to stay in their home community; ten respondents felt their migration trips were beneficial; and four respondents were undecided. Nineteen respondents reported that their families' view of rainy-season migration was largely negative. However, some respondents implied that their own and their families' perception were largely determined by the amount of money they earned with *galamsey* or farming in Southern Ghana. A 24-year-old migrant said:

> My family is not always happy when I go to the south to do *galamsey*. It really depends on whether I can manage to bring them some money or food back home.

Remittances sent home by migrants are mainly used for fertilizer and food purchases that basically compensate for the lower yields, which result from the migration-related reduced manpower during the rainy season. During the absence of migrants, it is mainly the younger, often underage, siblings' and older relatives' responsibility to take care of rain-fed agriculture.

Besides the need to support their families, the preference for rainy-season migration is also related to the migrants' wish to earn money for their own purposes —the purchase of electronics, paying for an apprenticeship, building their own house. But the underlying reason why rainy-season migration is a preferred choice for many migrants is the uncertain nature of rain-fed agriculture in their home communities.

In addition to the difficult infrastructural challenges and the decreasing soil fertility—which can be mitigated with fertilizer application—increasing rainfall-variability contributes significantly to the uncertainty of rainy-season farming in the migrants' views. A 21 year old said: "It is better I go to the south during the rainy season and do some *galamsey*. It is more beneficial than farming here as the rains are becoming more and more unreliable."

Galamsey is dangerous work due to frequent industrial accidents such as collapsing pits (Aubyn 2009), and the financial outcomes are very uncertain. Despite these risks, rainy-season migration to the *galamsey* sites has become the preferred *gambling game* over rain-fed agriculture. An 18-year-old migrant put it as follows: "It depends on the rains. If the rains are good for us, staying here and farming is good. But the probability of getting something in the south is higher than here."

Nonetheless, this does not mean that migrants are willing to reject small-scale agriculture out of hand. Only three respondents stated that they could imagine that their respective families would one day give up farming completely; although two respondents reported that they had actually given up farming already. The majority of respondents said that they would never give up farming but they would maintain it at a reduced or minimal level in favour of migration or other economic activities. Pragmatic, economic reasons were cited for continuing to farm. Eighteen respondents took the view that the labour invested in subsistence farming saved money as it reduced the portion of cash income needed to purchase food. A 32-year-old household head said: "I will never stop farming as it simply saves money."

Only nine respondents considered subsistence farming a part of their cultural identity, a notion that would discourage them from giving up farming completely. The relative loss of importance of farming is also reflected in the desire of nearly all migrants to invest money earned during their rainy-season trips in non-agricultural activities like trading or non-agricultural apprenticeships (e.g., car mechanic, construction trade). Almost half of the respondents were saving money for an apprenticeship programme or other non-agricultural activity, or have concrete plans to do so.

3.6 Conclusion

Evidence from the Nadowli District of Ghana's Upper West Region shows that environmental change in Northern Ghana is an important factor that has turned subsistence farming during the rainy season into an ever more risky endeavour. Increasing rainfall-variability leading to a higher probability of heavy rainfall events and intra-seasonal droughts increase the risk of harvest failures. They also enhance the risk of food insecurity particularly for poor and vulnerable households. Exposure to the increased risk of food insecurity has also had an interesting impact on seasonal migration patterns. In the traditional seasonal migration pattern, young migrants from Northern Ghana left their families at the beginning of the dry season (around November or December) to work in the commercial agriculture or mining sector in Southern Ghana and returned around April and May to start rainy-season farming in their home communities. Basically, the advantages of dry-season migration are financial, material and social remittances, and reduced household food stress.

Survey results show that the formerly dominant dry-season migration pattern is no longer the norm. Migrants from poor and vulnerable households prefer—or are forced to—migrate during the rainy season and thus cannot support their families by doing rain-fed subsistence agriculture. Most of the migrants moving to the south during the rainy season perceive their trips as some sort of a gambling game. It is a game which is more attractive than rain-fed agriculture, despite the fact that informal gold mining or *galamsey*, the preferred destination sector of most migrants, is dangerous. The prospect of danger and uncertain financial earnings are more attractive to migrants than the tedious work on the home farms during the rainy season, which often results in poor harvests. If migrants cannot manage to remit money, food or other material goods to their families during their rainy-season trips, they put their households at risks of a downward spiral into abject poverty. The loss of the labour force on the family farms that is not compensated with remittances usually leads to reduced harvest amounts and hence decreased food security. In short, the example from Nadowli District provides evidence that migration in the context of environmental change is not per se an adaptation strategy, as it may put already poor and vulnerable households under additional food and livelihood stress. But it is not only a temporal shift in seasonal migration, it is a change of livelihood preferences as the migration patterns are also associated with a reduced commitment to subsistence farming. Although a large majority of migrants interviewed want to maintain rain-fed agriculture on their family-farm plots, they want to do so at minimum levels for pragmatic reasons. Most respondents cited non-agricultural professions as their future aspiration and were making plans accordingly.

This case study calls for a new paradigm, one that would resolve the contradictions between climate-change adaptation and development, and transform the simplistic coping/adaptation frameworks into a more holistic approach that takes into account young people's aspirations and the perceptions that shape their actions.

Although still a concept in the making, social resilience, which is also based on a transformative capacity along with coping and adaptive capacities (Keck and Sakdapolrak 2013), could be a component of such a concept. The ongoing loss of importance of (smallholder) agriculture together with an increased orientation toward non-farm jobs in Northern Ghana can indeed be labeled a transformation process that has the potential to increase the future well being of the poorest and most vulnerable households.

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Chapter 4
Social and Spatial Inequality Linked to Flood-Induced Displacements in Burkina Faso in 2009 and 2010

Véronique Lassailly-Jacob and Malika Peyraut

Abstract Over the past twenty years, Burkina Faso has experienced periodic episodes of torrential rainfall which caused flooding that affected populations, habitats, agrarian and pastoral systems, and the economic infrastructure. In a case study of flood events in Ouagadougou and the northern and central regions in 2009 and 2010, we analyzed the geography of flooding, the population displacement that occurred, and the public policy responses. Victims in the capital city had more visibility and received more assistance, whereas the media and authorities quickly forgot about those who were affected in rural areas and small towns. This chapter looks at the geographical differences and social inequality at local and national levels in terms of the exposure to environmental hazards and of the emergency relief and rehabilitation policies implemented to cope with extreme climate events.

Keywords Burkina Faso · Flood-induced displacement · Geographic inequality · Social inequality · Rehabilitation resettlement

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4.1 Introduction

The Fourth Assessment Report (AR4) of Working Group II of the Intergovernmental Panel on Climate Change (IPCC) identifies migration as a livelihood adaptation to climate variability and change in Africa: "The role of migration as an adaptive measure, particularly as a response to drought and flood is also well known. Recent evidence, however, shows that such migration is not only driven by periods of climate stress but is also driven by a range of other possible factors" (Boko et al. 2007 [452]). The IPCC's Fifth Assessment Report (AR5 Working Group II) also foresees a rise in the potential for climate-induced migrations in Africa, but cautions that "the picture for future migration is much more complex than previous assessments of a rise in climate-induced migration suggest, and relates to the intersection of multiple drivers with rates of global growth, levels of governance, and climate change" (Niang et al. 2014 [1239]).

The case study presented here examines whether climate-induced migration is always an adaptive measure and looks at the social consequences and multiple factors underlying such migrations. The research took place in Burkina Faso (formerly known as Upper Volta), a Sahelian country. The Sahel is a region sensitive to climate change with a long history of periodic droughts and episodic flooding. Drought-induced displacement in this part of the world tends to receive a lot of attention, because Sahelian countries are characterized in popular and academic literature as especially drought-prone. Pastoralist mass migrations resulting from severe droughts in 1968–73 and 1983–85 have been well documented and have been at the centre of public policy-making (Bernus 1995, 1999; Gallais 1977; Horowitz and Little 1987; Ouedraogo 2007). This chapter enquires into the less well-studied phenomenon of flood-induced displacements. Over recent decades, Sahelian countries have experienced torrential rainfall events accompanied by flash floods that affect populations, habitats, agrarian and pastoral systems, and economic infrastructure. In August 2013, for example, heavy rains in Bamako set off flash floods that killed 37 people and displaced 20,000 (OCHA 2013). The human impact of these flash floods and consequent population displacements have drawn little attention to date.

The first section of this chapter compares drought-induced with flood-induced migrations in the Sahel. The characteristics of the populations in this area are then presented along with the context of sudden-onset events, such as floods. After describing our methodology, we discuss the field results and make linkages between social inequality and the geographical location of flooded areas, and the degree to which public authorities are responsible for the extent of the damage in both towns and the countryside. In the final section, we raise questions about how social inequality relates to public policy action (relief and rehabilitation) to mitigate the impact of such disasters.

4.2 Drought Versus Flood-Induced Displacements in the Sahel

Sahelian countries are known for being adversely affected by slow onset disasters such as drought. Many studies have been done on the food shortages and displacement southwards of northern herders during the 1968–73 and 1983–85 droughts. Gado (1993) described the successive food crises linked to drought and locust invasions in the Sahel, with a focus on its demography and population movements since 1870. Boutrais (1999) examined the migration of Fulani pastoralists fleeing the Djelgodji area in northern Burkina Faso to seek refuge in Bondoukuy, a village in the south. They were considered *drought refugees*, since they had lost their livestock and had to work for wages by tending the livestock of local agro-pastoralists. Poor and ruined, these people tried to survive in a rural environment by gradually building up new herds (Boutrais 1999 [172]). Other researchers (Bret 1989; Gallais 1977; Bernus 1995) have also studied the strategies pursued by Sahelian pastoralists and farmers for coping with drought. The populations who depend on natural resources to make a living have over the centuries developed a variety of strategies to cope with drought. A recent strategy pursued by some families is to undertake complementary activities involving small-scale trade, transportation or horticulture, for example. Nevertheless today, pastoralists, as reported by Bernus (1995), are less able to adapt successfully to climate risks and find it harder to react through mobility. This is a consequence of the increased number of conflicts between pastoralists and farmers, and the restrictions placed on pastoralists by the state, which now owns and manages rangeland. Added to this is the perception by many communities of the pastoralists as pariahs (Bernus 1995).

Growing concerns about climate change have spawned action. For example, Burkina Faso's National Adaptation Program of Action (NAPA) on climate change specifically mentions environmentally-induced migrations as a concern (Burkina Faso 2007). NAPA is part of an international action plan under the United Nations Framework Convention on Climate Change (UNFCCC) to help less developed countries implement national adaptation policies. NAPA was written by Conseil National de l'Environnement et du Developpement Durable du Burkina Faso (CONEDD) and establishes priorized actions to enhance the country's capacity to adapt to climate change. Migration is viewed by NAPA as an endogenous adaptation, a means spontaneously used by populations to cope with changing conditions, including climate change. At the same time, NAPA sees migration as evidence of a failure to adapt to climate change. It states that migration can exert pressure on natural resources, thus leading to degradation of the environment and a risk of conflict. Successive droughts between 1908 and 2004/2005 were said to have caused mass migrations, as large numbers of people moved from the central plateau to the west or east. According to NAPA, these migrants looking for better living conditions have been a major factor in land degradation in the areas where they have settled (Burkina Faso 2007).

The NAPA report also states that transhumance is both a risk factor and a direct consequence of climate change and that, in spite of it becoming a widespread practice, transhumance should be eradicated. NAPA has suggested reinforcing the ability of pastoralists to adapt by other means such as a settling process to reduce transhumance and the ensuing conflicts between herders and sedentary farmers. In short, migration and the risk of conflicts associated with seasonal migrations are seen by government authorities as a failure to adapt to climate change. This point has also been made by Gemenne (2009, [70]).

Of particular relevance to the discussion in this chapter, flood-induced displacements are not mentioned anywhere in NAPA. Although slow-onset disasters like drought could indeed become worse in Burkina Faso in coming years, authorities and populations would have time to institute long-term, proactive plans for mitigating the impacts through farming policies, reforestation, irrigation or new agricultural techniques such as the *zaï* practice (sowing in large holes). By contrast, sudden-onset disasters such as the 2009 and 2010 floods occur abruptly and unexpectedly. These events have attracted mainly short-term responses and emergency actions with little thought to preventative measures or other planning. It is a challenge that academic research has so little to say about flood-induced displacement in the western Sahel compared with the many studies and reports on drought-induced displacement or international migrations and their impacts on development. The findings reported in this chapter therefore represent one of the few studies to consider the relationship between flooding and migration in Burkina Faso, and represent a starting point for considering proactive responses to address the risks of flood-related population displacements in the future.

4.3 Study Region

This chapter considers the effects of sudden-onset flooding in 2009 and 2010 on population movements in rural and urban areas of Burkina Faso. A low-income, landlocked Sahelian country, Burkina Faso's population was estimated at 16,934,000 in 2013 (World Bank 2013) up from 14,017,262 inhabitants in 2006 (Burkina Faso 2006). The country has experienced many mass migrations since the colonial period, some internal and others external, some spontaneous and others sponsored by authorities. Burkinan migrations are among the best known in Africa owing to the many national surveys and research studies devoted to them, including a 1974–1975 national survey on migratory movements; a 1992–1993 national survey on migration and urbanization; and a 2000 survey on migration, urban integration, and environment (EMIUB) (Ouedraogo 2007, [265]).

Burkina Faso has a history of mass migrations since colonial times, when it was known as Upper Volta. Generally speaking, there have been four episodes or clusters of mass migrations in this part of Africa.

- The first was the result of colonial rules on compulsory labour and imposed taxes, which forced people to migrate to neighbouring countries. Development of rice plantations in Mali, and cocoa and coffee plantations in the Ivory Coast and Ghana attracted these migrant populations (Gregory et al. 1989). After independence, Upper Volta and the Ivory Coast negotiated labour agreements for fostering and managing large-scale economic migration.
- A second mass population movement was the internal rural migration promoted by state authorities during the 1970s. This was done in an effort to settle migrant farmers along the banks of the Volta River where river blindness (*onchocerchiasis*) had been eradicated. The Volta River Authority was established to deal with the issues of settlement and development (Marchal and Quesnel 1997).
- A third incidence of mass migration imvolved the forced repatriation of immigrants to Burkina Faso from the Ivory Coast during the Ivorian crisis (1999 to 2002) (Bredeloup 2009, Zongo 2008, 2010, Ouedraogo 2010). This movement gave rise to the Bayiri operation, overseen by the Burkina Faso government, that involved the distribution of emergency assistance at the border, transportation of people to Ouagadougou and then to their province or village of origin, and implementation of measures to re-integrate returnees socially and economically (Ouedraogo 2010).
- The fourth of the large-scale migrations that occur periodically in Burkina Faso is thought to be caused by climate change. Because of irregular periods and volumes of precipitation,[1] the country experiences frequent climatic risks such as wind storms, droughts, excessive rain, and peaks in temperature, all of which can incite environmentally induced migrations. Here we are most interested in migrations caused by flooding, such as those that occurred in September 2009, when continuous, heavy rainfall caused destructive flash floods in parts of the country (see Fig. 4.1). On 1 September 2009, precipitation fell nonstop for seven hours—a total of 263 mm. In the words of one flood victim, "I have never seen such rainfall. It was God's will." Another observed, "The floods of 1 September 2009 in Ouagadougou marked the start of an awareness of climate change in Burkina Faso." On that day, registered casualties were 41 dead and 62 injured; 180,386 left homeless; and 33,172 houses damaged or destroyed in the central and western regions of the country (Burkina Faso 2010a). For the first time in recorded history, even the capital city of Ouagadougou was severely affected by flooding. The following year in July 2010, sudden flooding in the Sahel Region (Soum Province), Centre-Nord Region (Bam, Sanmatenga and Namentenga Provinces) and East Region (Gnagna Province) caused 15 deaths and left 84,000 people homeless (Burkina Faso 2010b). Some provinces such as Gnagna, Sanmatenga, and Ganzourgou were affected by both the 2009 and 2010 flood events (see Fig. 4.1).

[11]The climate is Sahelian in the north (<600 mm of precipitation per year), Sudano-Sahelian in the centre (between 600 and 900 mm per year) and Sudanian in the south (>900 mm per year). However the isohyets frequently shift between these three zones with, as a result, irregular rainfall.

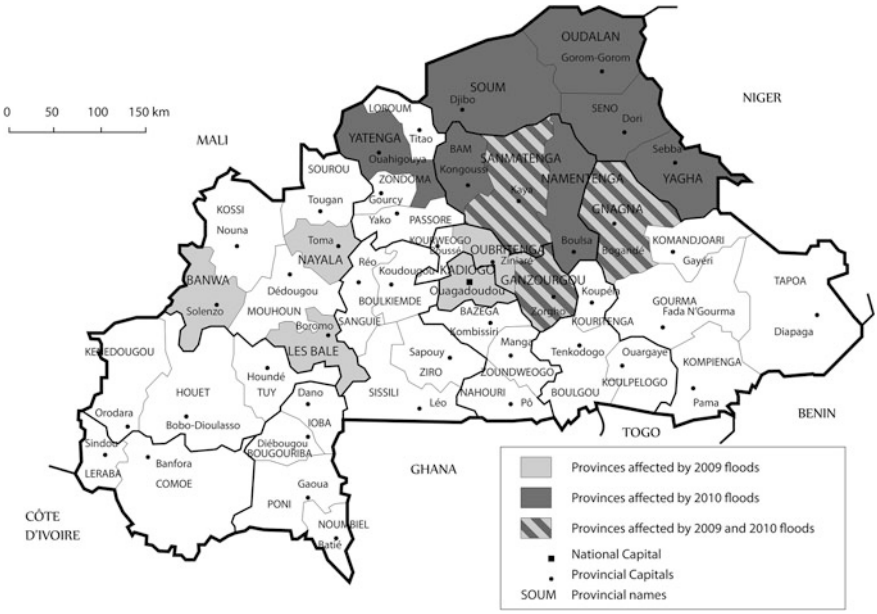

Fig. 4.1 Burkina Faso provinces affected by 2009 and 2010 floods. Atlas de l'Afrique, Burkina Faso, les éditions Jeune Afrique 2001—SALB, institut géographique du Burkina, FAO, ASTER, CONASUR (2009)—Map Action and OCHA (available from Relief Web) (2010)

4.4 Methodology

As noted by Cournil and Mayer (2014 [18]), the discourse on environmental migrations is mostly a discourse about the migrants rather than a discourse produced by the migrants. That's why most of the data presented in this chapter was collected by the authors during three periods in the field between 2010 and 2013. We conducted empirical research through in-person interviews in the urban areas of Ouagadougou, and one of its districts, Bogodogo, where flooding had been severe; Yagma, a resettlement site near Ouagadougou for flood victims from the capital city (Kadiogo Province); Kaya and Tougouri (Sanmatenga Province); and Bogande and Mani (Gnagna Province). We also conducted surveys in the rural areas of Saaba-Tanghin (Kadiogo Province), Nioniougou, Siedougou, and Koala villages (Gnagna Province) (see Fig. 4.2). The most important survey was conducted in the Yagma resettlement site, where 76 people were interviewed (see Table 4.1).

Data was collected using semi-structured interviews with individuals and focus-group discussions. The intent was to collect points of view about how flooding affected people and how the situation was managed. Questions asked included: What did the population see as the causes of the recent floods? How did interviewees spontaneously react—through mobility or immobility? What kind of

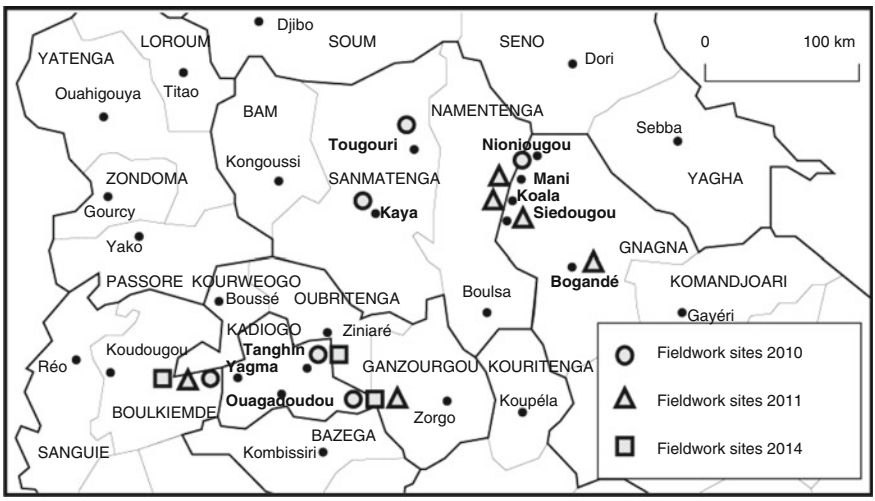

Fig. 4.2 Map of Burkina Faso fieldwork sites. Atlas de l'Afrique, Burkina Faso, les Editions Jeune Afrique, 2001

help was offered, and who was entitled to receive it? Who had been hardest hit, and why? (see Table 4.1).

Among the 185 interviewees, 9 were academics and consultants; 14 were members of national or international NGOs; 20 were government officials; 7 were local authorities; and 135 were flood victims (see Table 4.1). Details about the interviewees' institutions and status are in Table 4.2.

In carrying out our research, we were cognizant that respondents' perceptions of our role may have influenced their responses. In 2010 and 2011, we visited recently flooded areas that had just been or were being visited by public officials, NGOs, and international organizations. We were often perceived as being NGO representatives or journalists rather than arms-length researchers, a status difficult to explain and justify during an emergency. For example, in the village of Nioniougou, the chief (*naba*) insisted that two shop-owner victims of the floods be interviewed because he thought the lead author was an NGO representative and as such would be able to compensate them. Further, we were usually accompanied by a village councillor or an official from the Ministry of Welfare, who introduced us and selected the interviewees. As a consequence, in many locations our sample may not be representative nor correspond to the full range of situations resulting from the flood. In Yagma, however, we were able to recruit interviewees at random in public places. Most other interviews were carried out at the interviewee's home, in the chief's (*naba*) courtyard, or in public areas such as shops. Because interviewees often saw us as journalists or NGOs, they mostly focused on their suffering, on the present situation, and the lack of assistance. Our experience highlights the challenges academics face when conducting this sort of research during a crisis, and the need to be aware of the ethical considerations that come into play.

Table 4.1 Interviewees and sites of research

The survey												
Provinces												
	Kadiogo				Sanmatenga		Gnagna					
Sites of research interviewees	Ouagadougou	Bogodogo	Yagma	Saaba-Tanghin	Kaya	Tougouri	Bogande	Mani	Nioniougou	Siedougou	Koala	Total
Academics	9											9
Government officials	7			3	6		2	1			1	20
NGOs members	7		2		2		2				1	14
Local authorities		1	2	3							1	7
Flood victims		3	72	7	3	1	7	15	4	9	14	135
Total	23	4	76	13	11	1	11	16	4	9	17	185

Table 4.2 Categories of interviewees

Academics and consultants	University professors and students	4
	Researchers from IRD, Research Institute for Development	3
	Consultants and Institutes directors	2
Members of international NGOs and organisations	ONU Habitat	1
	OIM, International Organisation for Migrations	1
	HELP Burkina assistance allemande	1
	Africare	2
	Action contre la faim	3
Members of national NGOs	Plan Burkina	1
	ATAD, Alliance Technique d'Assistance au Développement	1
	ODE, Office de Développement des Eglises Evangéliques	2
	AGED, Association pour la gestion de l'environnement et le développement	2
Government officials	CONEDD, Conseil National de l'Environnement et du Développement Durable	2
	CONASUR, Conseil National des Secours d'Urgence	2
	Direction Générale de la Protection Civile	1
	CONAREF, Commission Nationale pour les Réfugiés	2
	Ministry of Welfare and National solidarity	5
	Ministry of Housing and Urban Development	2
	Mayors	2
	Deputy Mayors	2
	Prefects	1
	Secretary-General of Governorate	1
Local authorities	Nabas, chiefs	5
	Village committees	2
Flood victims		135
Total		185

4.5 Flood-Induced Displacements and Location-Related Inequality

The areas hit hardest by the floods were located in the driest parts of the country—the northern and central regions (see Fig. 4.1). At local levels, we observed the most heavily affected locations were along river banks and water reservoirs, on slopes, and in low-lying urban areas.

In rural areas we studied, not surprisingly the victims were mainly people who lived near water reservoirs and catchment basins. In Tougouri, Nioniougou, and Saaba-Tanghin, interviewees showed us the flooded areas where rising waters had caused dykes to collapse, damaging nearby homes, granaries, and crops, and causing the loss of small livestock. Dykes and dams collapsed one after another on the tributaries of the Mouhoun, Nakambe, and Niger Rivers. Food shortages became an acute problem in rural areas following the 2009 and 2010 floods, which struck between two farming seasons. Unharvested crops were damaged and granaries which contained seeds for planting were destroyed. On a September 2010 site visit to Tougouri, we saw mud houses and granaries that had collapsed the previous July, and saw many sorghum, millet, and rice fields that had been destroyed. A sad example of what we encountered involved a 71-year-old man sitting next to the ruins of his home. When asked why he stayed there alone, he told us he was guarding the metal sheets used for roofing and the wood used for window-frames. His wife and children were sheltered in the school, where they had been given food and blankets, but would soon be transferred to a Red Cross resettlement site to live in tents. He said that, although he managed to save his first rice harvest which had been stored in the granary thanks to help from neighbors, he had lost the second rice harvest as well as his millet and sorghum crops. This farmer had migrated to Tougouri from Boulsa 45 years previously because he had family connections here and a reservoir had been built in Tougouri. He knew that he had settled in a low-lying, flood-exposed area, but he thought that after so many years of persistent drought, there was little chance of heavy rains ever returning.

Many small dams and reservoirs had been constructed in the flooded areas during the 1980s and 1990s to help the rural population cope with recurrent droughts that threatened people's subsistence and the economy (see Fig. 4.3). These reservoirs stored water to irrigate vegetable and rice crops and to provide habitat for fish. They were seen as an important and highly successful adaptation to drought and dryness. The significance of their contribution to rural poverty reduction and improving the livelihoods and food security of smallholders was noted by Ceechi (2007, [1]), who wrote: "Burkina Faso, with more than 1500 lakes and reservoirs largely scattered at the national scale, appears for a long time as a leader country regarding the number of and the importance devoted to, these infrastructures." Over the years, large numbers of fishermen, herders, and farmers migrated from drought-prone areas elsewhere to settle around these reservoirs, and it was some of these people who lost their lives, homes, and/or livelihoods to the floods. Many interviewees noted that the dams and dykes were poorly maintained, and many had burst on previous occasions (see Fig. 4.3).

In Ouagadougou and other urban areas, the greatest loss of life and property damage occurred in informal settlements in low-lying areas or near water reservoirs, where the density of structures trapped flood waters and prevented drainage. This can be seen in Fig. 4.4 taken in an informal settlement of Kaya. As can be seen in the photograph on the left (see Fig. 4.4a), the street running parallel to the slope is

Fig. 4.3 Collapsed dyke at Tanghin. Photo by authors

blocked by a structure that trapped the flood waters, causing the mud houses on either side of the street to be inundated and their walls to subsequently collapse. The results are shown in the photograph on the right (see Fig. 4.4b).

Another reason for the extensive flooding in informal settlements in Ouagadougou was the dearth of drainage canals. The canals that were there were inadequately maintained, as noted by Sanogo (2013), full of waste, or blocked by unauthorised construction.

During the flooding, residents fled first to the streets above the flooded areas, waiting long hours before being moved to temporary shelters in administrative buildings, schools, and even a racetrack. Said one interviewee: "Floods revealed the anarchy in the management of Ouagadougou," and another said: "Floods revealed dysfunctions at all levels of planning."

Fig. 4.4 Sloping street and destroyed houses in Kaya settlement. Photos by authors

4.6 Inequality and Public Policy Actions

When the floods occurred, Burkinan authorities from the National Council of Emergency Relief (CONASUR [Conseil National des Secours d'Urgence]) and other national and international NGOs initiated rapid but uncoordinated actions to assist victims. Informants described how there was a tremendous national mobilization of resources for flood victims, but the distribution of aid was wanting. NGOs responded more quickly because, unlike government organizations such as CONASUR, they were not hindered by onerous administrative procedures. The drawback was that there were so many NGOs at work, they had trouble coordinating their activities. During the emergency phase, the first priority for authorities was to identify the casualties and determine who was entitled to official recognition as a flood victim.

Inequality quickly ensued from the criteria chosen to categorize flood victims. An officially recognized *flood victim* was defined as someone whose home had collapsed and who had taken refuge in a public shelter. In Saaba-Tanghin, interviewees who had lost their homes were told that they had to seek shelter at the school if they wished to be registered for relief; but people who sought refuge with friends, relatives, or in other non-official shelters were not given official recognition. This was particularly problematic in rural areas like Nioniougou or Koala, where official shelters were few, and many flood victims were taken in by neighbours or family, thereby disqualifying them from receiving relief. Furthermore, people who had lost crops, livestock, goods, or shops were not entitled to compensation or relief —only loss of a home counted.

As a consequence, families were often broken up during the emergency phase. In Kaya for example, one resident told us that he stayed in his compound while his four wives and twelve children moved to the school used as a shelter, in order to become officially registered flood victims. He meanwhile stayed to take care of what had been left behind and to start rebuilding. He showed the author three houses and a wall he had rebuilt in his compound using aid received from the Ministry of Welfare. When asked why he had rebuilt in the same spot that had been so badly flooded, he said he did not know where else to go and that he was skeptical of government plans for a resettlement project to be built on the periphery of Kaya.

The government announced plans to resettle all flood victims and restore damaged or destroyed infrastructure across the country. However, an observable gap quickly emerged in the rate and nature of reconstruction between the capital city and the other affected areas. In Kaya, the promised resettlement area lay far outside town and interviewees said they would never move to such a distant housing development. Not only was it too far from town, they complained that the lots were too small. Meanwhile in Saaba-Tanghin, the Tanghin dam had by 2013 still not been restored (see Fig. 4.3). The farmers and herders interviewed there complained about the loss of farming opportunities and the lack of water for their cattle during the dry season. Young people had difficulty finding employment. Some pursued informal activities such as collecting sand for bricklayers, while

Fig. 4.5 Yagma: Resettlement site for flood victims from Ouagadougou. Photo by authors

others were planning to migrate to another reservoir or to work in gold-mining areas during the dry season.

In Ouagadougou, the government's official resettlement-program objective was to prevent victims from rebuilding in flooded areas. A resettlement site was established near Yagma, a small village about twenty kilometres northwest of the capital, on the road to Ouahigouya (see Fig. 4.5). Only flood victims who had lived in Ouagadougou and who owned houses that had been destroyed were eligible for resettlement to Yagma. Renters—which some of the victims were—were ineligible. Those who resettled to Yagma were supplied with building materials, including 10 bags of cement and 20 corrugated sheets. They also received 50,000 CFA francs and the ownership of a *parcelle*, a plot of land to rebuild a new home. About 24,000 plots of land were allocated but 5 years after the flooding, many new settlers had left their plot and returned to Ouagadougou. The new settlers in Yagma experienced considerable difficulty making a living because the site was too far from health clinics and secondary schools, transportation was scarce, local economic opportunities were limited, and basic services like water and electricity were lacking. A trapped population emerged in Yagma made up of people—mainly women—who could not find employment and were too poor to buy a bicycle or motorcycle to commute into Ouagadougou. In other words, the official resettlement plan exacerbated conditions of inequality and poverty for the poorest of the flood victims.

4.7 Discussions and Conclusions

Unlike droughts, which are slow-onset disasters with broad geographical impacts that affect livelihoods but not housing stocks, flooding is a sudden-onset disaster that affects specific areas and damages buildings, farmland, and infrastructure.

Whereas drought induced-displacements in Sahelian countries emerge more gradually and affect primarily farmers and herders, flood-induced displacements are sudden and affect rural and urban populations alike. In Burkina Faso, governments have invested in long-term plans for adapting to droughts, but are often caught unprepared for floods. Short-term responses and emergency actions prevail, and long-term planning is neglected. With few alternatives and limited access to government assistance, flood victims are left to fend for themselves, which for some means relocating elsewhere.

Geographical and social inequality creates particular groups in Burkina Faso who are more vulnerable to experiencing harm from floods, and who are consequently more predisposed to displacement and migration. The geographical dimension is plainly evident because those who are most vulnerable live in low-lying areas or close to reservoirs, dams, dykes, and embankments. These geographical dimensions are the same for people in rural and urban areas and are accompanied by a dimension of social inequality. Most settlements in flood zones are informal or unofficial, and are therefore disproportionately occupied by the poor and socio-economically marginalized.

A difference in circumstances emerges after the flood event. In rural areas, we observed that displacement tended to be temporary and take place over short distances, with residents returning to and resettling in the flood-affected areas. This is in part because official intervention was lacking. In urban areas like Ouagadougou, where authorities imposed constraints on resettlement, displacement from the flooded areas tended to be more permanent in nature and encouraged relocation to more distant areas.

Looking to the future, a major consideration must be the public authorities' role in preventing flood disasters, responding to disasters, and offering relief and resettlement afterwards. Past-Burkina Faso government flood-relief efforts have deliberately targeted the capital city and neglected the less visible inhabitants of rural areas and small towns. Rural inhabitants continue to live in flood-prone locations, but failure to rebuild dams and reservoirs leaves them with fewer livelihood opportunities than before the floods. Young people particularly are struggling, and many leave for other regions on seasonal or permanent bases. The criteria used to designate people as eligible for flood relief were problematic and need to be revisited. Questionable decisions were made to support homeowners but not renters; to replace housing but not businesses, crops or livestock; and to require victims to avoid seeking help from friends or family and instead gather in ad hoc emergency shelters. These decisions in many cases exacerbated post-flood socio-economic inequality and vulnerability to future disasters. The resettlement of Ouagadougou's flood victims has been a particular failure on two levels: first, by excluding renters who made up a portion of victims; and second, by choosing a site with no amenities or livelihood opportunities. As a result, Ouagadougou's flood victims have generally been made more vulnerable, and a subset of victims has been trapped in the Yagma settlement with few prospects of recovery. There are many lessons to be learned from this case study to remind us that the environmental drivers of migration in Sahelian Africa are not limited to drought and dryness.

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Chapter 5
Exploring the Relationship Between Social Inequality and Environmentally-Induced Migration: Evidence from Urban Household Surveys in Shanghai and Nanjing of China

Yan Tan, Xuchun Liu and Graeme Hugo

Abstract This chapter improves our understanding of the complex relationship between climate change, social inequality, and migration in urban areas. The role of multi-dimensional inequality (material, social, and power inequality) in influencing spontaneous migration decisions at the household level is examined in urban settings of China's Yangtze River Delta. This study uses a two-stage econometric framework to demonstrate the complexity of migration decision-making in the context of climate impacts in the study area. The framework allows us to examine how social inequality shapes the severity of climate impact experienced by households, and how social inequality interacts with this experience to influence migration decisions. We pilot this approach in selected metropolitan areas of Shanghai and Nanjing. The results show that all dimensions of social inequality are significantly associated with people's experience of climate impacts and subsequently their migration decisions. The two-stage framework provides policymakers and planners with a robust tool that can be used to formulate better policy measures that either enable the disadvantaged groups to adapt in situ or provide these groups with real opportunities and capacities to migrate.

Keywords Climate change · Social inequality · Migration · In situ adaptation · Yangtze river delta · China

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5.1 Introduction

Social inequality is an important contributor to increasing vulnerability of communities and people in the context of climate change by jeopardising their ability to adapt (Adger and Kelly 1999; Paavola and Adger 2006). Human migration, as a response to climate change (McLeman and Smit 2006), is considerably influenced by inequality (Bolin 2007). There is substantial research into linkages between dimensions of social inequality, such as income and education, and migration decisions. However, attempts to systematically model the role of multi-dimensional inequality in shaping households' migration behaviour have been limited. This is particularly the case in urban areas (Mehrotra et al. 2009; Rosenzweig et al. 2010).

Using primary data, this study examines the ways in which different dimensions of social inequality influence a household's adaptation strategy to climate change in general, and migration in particular, in urban settings of China's Yangzi River Delta (YRD). The YRD is a special case because it has experienced significant climate change (Wang et al. 2012), increased social inequality (Song 2009), and massive levels of migration (PCOSC 2011). The region is an area with one of the largest concentrations of inter-provincial rural-urban migrants in China. It is also a hot spot of internal migration within the Delta where people move across at least the boundary of a district or county (China Daily 2013). The megacities of Shanghai and Nanjing (provincial capital of Jiangsu) in the Delta were selected as a case study for the present analysis, because they exemplify the socio-economic, demographic, and environmental characteristics of the region. The study adopts a two-stage framework to analyze how inequality influences people's experience of climate change impact in Stage I (*impact stage*) and their migration or adaptation choices in Stage II (*response stage*).

5.2 Literature Review: The Relationship Between Climate Change, Migration, and Social Inequality

Climate change has had significant impacts on natural and human systems (IPCC 2007 (1–3)). Specific domains of impacts on population include: (i) increased mortality and reduced health status (Shuman 2010; Peng et al. 2011); (ii) deterioration of livelihood and economic situation (Tol 2009; Oral et al. 2012); and (iii) worsened living environment (Perch-Nielsen et al. 2008; Lwasa et al. 2009). To adapt to these adverse impacts, people have adopted migration (McLeman and Smit 2006) and in situ adaptation (e.g., improving crop-farming techniques, water management and ecological rehabilitation, changing lifestyle, and enhancing

infrastructure and building) (Osberghaus et al. 2010, Hisali et al. 2011). In addition to migration and adaptation is the option of non-adaptation (i.e., staying but doing nothing), which is not an unusual householder response even when people experience or perceive the impacts of climate change (Tompkins and Adger 2004).

Human migration is a significant consequence of climate change (or environmental change more broadly defined) (UK Foresight 2011). There is a growing consensus among researchers that migration can be understood as an adaptive response rather than a problematic outcome of such change (Black et al. 2011a; Adger and Adams 2013). Understanding the mix of forces that drive migration and the role played by climate change requires a holistic approach informed by the breadth of migration, development, climate change, and environment theoretical and policy perspectives. Existing migration theories have addressed various drivers of migration from different perspectives, including neoclassical economics (Massey et al. 1993), social structural change (Sassen 1998), and social capital (Massey 1990). Climate change can shape migration by influencing various factors encapsulated in migration theories.

Inequality can be considered as *unequal access* to socio-economic resources among people in a community (Goldthorpe 2010). Grounded on the fundamental theory of class (Bourdieu 1984), and international studies of social inequality in general (e.g., Goldthorpe 2010) and climate change-related inequality in particular (Paavola and Adger 2006), three dimensions that measure social inequality are addressed in the study: *material* (the economic), *social status* (the social), and *power inequality* (the political). *Material inequality* refers to the uneven distribution of income, wealth, and property (Bourdieu 1984). *Social status inequality* is based on differences in education (Rye 2006) and occupation (Savage et al. 2005). *Power inequality* refers to the unequal participation in public policy-making processes and unequal access to public services (Thomas and Twyman 2005; Paavola and Adger 2006).

Neoclassical economics theory argues that it is the geographic inequalities in wage rates and labour markets that drive internal and international migration (Massey et al. 1993, p. 436). Chiswick (1999) suggests that economic migrants have a higher level of ability than those who remain, suggesting that inequality in the place of origin could differentiate people's migration behaviour. People suffering from inequality are also more likely to be displaced due to environmental problems, but they have little means and resources to facilitate the move and successful resettlement (Cutter 2011; Black et al. 2011a). Empirical studies indicate that households' migration decisions are influenced by their economic conditions and educational attainment (Stark and Taylor 1991; Stark et al. 2009; Hyll and Schneider 2014), relative to other households in the community. Yet in migration and adaptation studies in *urban* areas, there is still inadequate research that acknowledges the comprehensive dimensions of inequality and systematically investigates these dimensions.

5.3 A Two-Stage Conceptual Framework

Several frameworks conceptualizing the relationship between climate change and migration (e.g., McLeman and Smit 2006; Black et al. 2011a, b) acknowledge that the decision-making process to migrate (or not) is multi-staged. In their modelling of the influence of climate change on migration, Perch-Nielsen et al. (2008), for example, use the concepts of *direct* and *indirect effects* in order to link climate change and adaptation options. Specifically, climate change does not directly lead to adaptation but is linked indirectly through its impacts on the economic, social, and political determinants of adaptation (UK Foresight 2011). Adaptation research argues that people's adaptation is rooted in their actual experience of environmental problems (Sinden and King 1990). There are some studies investigating how migration is shaped by changes in crop and economic conditions due to climate change (e.g., Barbieri et al. 2010; Feng et al. 2010). However, there are few empirical analyses examining the multi-staged process of how climate change shapes people's experience of climatic impacts and how this experience influences their adaptation. It is worth noting that similar experiences of environmental problems among households can lead to quite different adaptation behaviours (Whitmarsh 2008). This is mainly because the translation of experience to adaptive behaviour is mediated by behaviour control factors, including socio-economic characteristics, skills, resources, and abilities (Fishbein and Ajzen 2010).

This study, grounded on existing expert knowledge about the links between climate change and adaptation, establishes a *two-stage framework* of the decision-making process of climate change related adaptation at the household level in a specific community (Fig. 5.1). In Stage I, impact refers to people's experience of climate change impacts on their economic situation, health status, and living environment. Such impacts provoke people's recognition of climate change as a problem and boost their intention to take action to solve or avoid the problem. In Stage II, response means people's choice between migration and in situ adaptation or non-adaptation after they experience specific climate change impacts. Social inequality is defined as the households' unequal holding and access to material, social, and political resources. As we will show, social-inequality factors have a direct effect on households' migration or adaptation decision-making at Stage II and indirectly influence households' migration or adaptation strategies by shaping their experience to the impacts of climate change at Stage I.

5.4 Data and Methods

We used a stratified sampling method to select 30 residents' committees in Shanghai and 20 in Nanjing (Fig. 5.2). Primary data was collected from a systematic random sample of approximately 600 households in each city. We used publicly available sources to construct a household roster and systematically drew

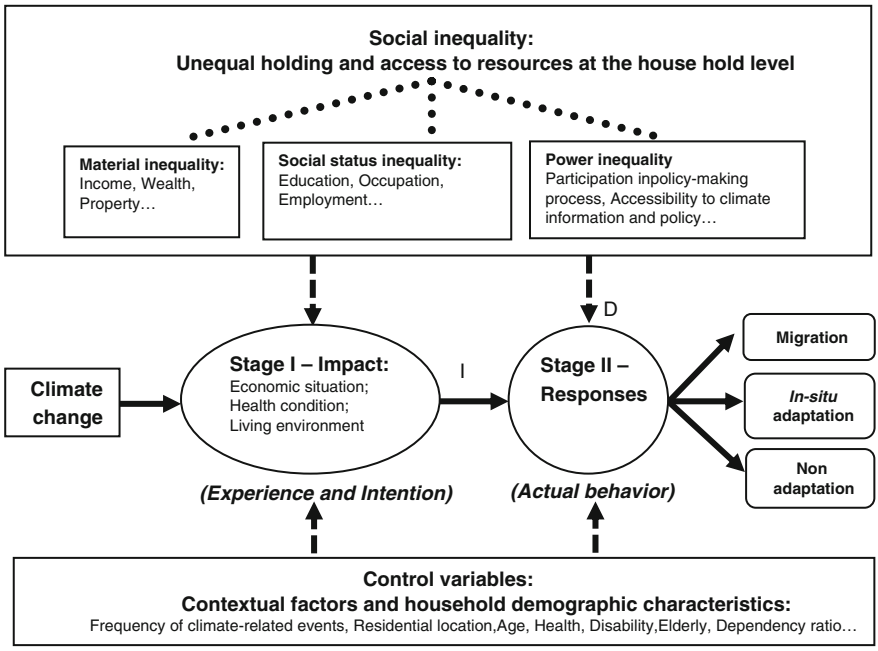

Fig. 5.1 Conceptual framework: two-stage decision-making process of responses to climate change Notes: *D*—direct effect of the inequality factors; *I*—indirect effect of inequality factors through impacts

random samples of households in each of the 50 selected local residents' communities. The sample was proportionately distributed to each local community to be surveyed using a Probability Proportionate to Size (PPS) sampling method. Face-to-face interviews of households were conducted from November to December 2011. The distribution of migrants' places of origin in our survey (Table 5.1) reflects the fact that more than three quarters of the migrants moved within the Delta.

5.4.1 Dependent Variables

There are two sets of dependent variables: one related to the three major domains of climate change impact on households in Stage I, and the other related to the three broad responses to climate change impacts in Stage II.

Domains of Climate Change Impact Before asking respondents about the impacts of climate change, we explained the definition of climate change used in this study. Both climatic variations in temperature and rainfall, and climatic extremes (e.g., droughts, typhoons, storm surges, floods, cold spells, heatwaves) or

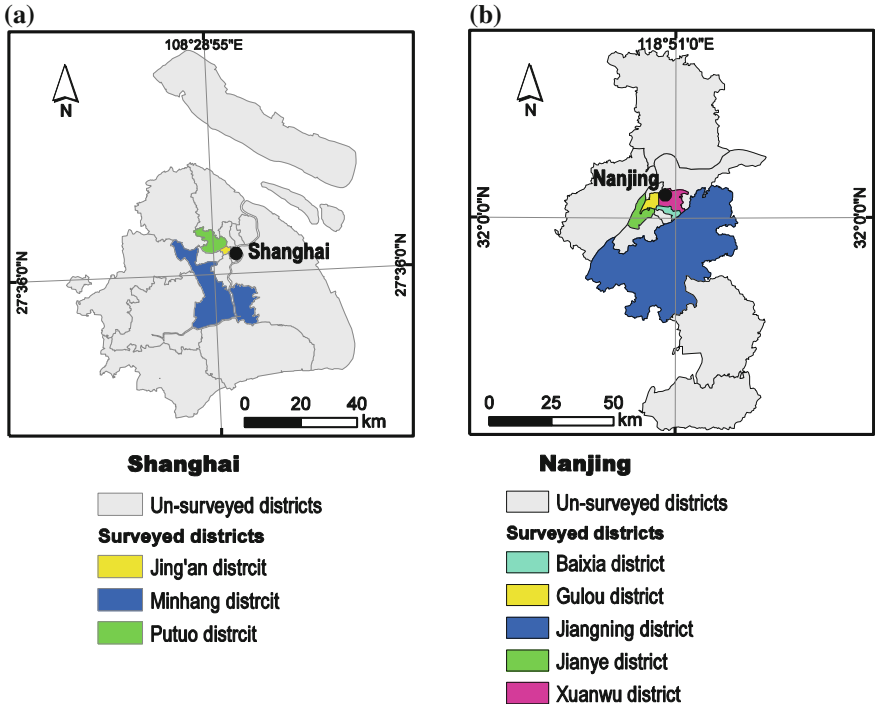

Fig. 5.2 Surveyed districts in Shanghai and Nanjing

Table 5.1 Distribution of the original residential places of migrants

Origin	Observations	%
The Yangzi River Delta (Shanghai, Jiangsu, Zhejiang)	488	77.1
Adjacent provinces to the YRD (Anhui, Shandong, Jiangxi, Fujian)	106	16.7
Other provinces	39	6.2
Total	633	100.0

Source authors' survey, 2011

climate-related hazards (e.g., smog, landslide) in the past five years (2007–2011) in the deltaic region (or areas of origin of migrants) were used as a proxy to measure climate change experienced or viewed by respondents. We then asked the participants: In 2007, did climate change have an adverse impact on your household's economic situation (e.g., decreased income, increased living cost), health (e.g., deteriorated general health condition, disability) and living environment (e.g., damaged housing), respectively? Responses per aspect answered were coded as 1 for 'yes' and 0 otherwise.

Responses to Climate Impact The surveyed households were categorized into three groups based on their responses to climate change impacts: migration, in situ

Table 5.2 Summary of the dependent variable in stage II response model

Responses		Observations	%
Migration	Entire household move	122	10.1
	Partial household move	57	4.8
In situ adaptation		895	74.7
Non-adaptation		124	10.4
Total		1198	100.0

Source authors' survey, 2011

adaptation, and in situ non-adaptation. This study defined *migration* as a movement of a whole household or part of its membership beyond the original district (or county) for six months or longer during the 5-year period to 2011, if the respondents reported climate change as a primary reason of their movement. In situ *adaptation* is defined as the adoption of one or more of the following measures to adapt to adverse climate impacts without the household members undertaking migration as defined above: reducing the household's use of electricity, water, and gas; reducing daily commuting by driving family car; limiting expenditure on high-priced food; and installing air conditioners. Households that did not migrate or undertake in situ adaptation measures fell into the *non-adaptation* group. Table 5.2 shows that for the Stage II response model, 15 % of households in the final regression sample (N = 1198) migrated in 2007–2011, about three quarters undertook various in situ adaptations without undertaking migration, and 10 % of them were classified as non-adaptation in situ.

5.4.2 Independent Variables

We used independent variables for 2007 to predict the first-stage dependent variables for 2007 and the second-stage dependent variables for the years 2007–2011. This avoided the problem of using current data to predict previous outcomes.

Social Inequality This study assessed *material inequality* by measuring households' income, wealth, and housing condition. *Social status inequality* was measured by employment status, educational attainment, and occupation. *Power inequality* was measured by the chance to participate in climate-related policy-making process and the access to information about climate change and its related policies and programs.

Control Variables To better understand the effects of social inequality on both stages of adaptation decision-making, we included a number of control variables such as household demographic characteristics (Afangideh et al. 2012) and contextual factors of climate change and residential location in 2007. The questionnaire asked: 'Did climatic or climate-induced events in the Delta (or areas of origin of migrants) occur frequently in 2007?' and 'Did climate variability in the Delta (or

areas of origin of migrants) vary apparently in the past five years (2007–2011) compared to the preceding years?' Answers to the questions were coded as 1 for 'yes' and 0 otherwise. The variable 'views on climate variability' was only used in the second-stage regression but not in the first-stage model. This was because the five-year period covered meant it would not be appropriate to use it to predict the climate impacts in 2007 in the first-stage regression. Specific definition and coding of each of the dependent and independent variables are presented in Table 5.3.

5.5 Two-Stage Regression Models

In Stage I, a Multivariate Probit (MProbit) model (Greene 2008, p. 827) is estimated to examine how social inequality influences three major domains of climate impact—economic situation, health condition, and living environment. One of the purposes of the first-stage model is to obtain the predicted probability of each impact, which was used as the independent variable in the second-stage model. Stage II uses a Multinominal Logit (MLogit) model (Greene 2008, pp. 843–844) to investigate how and to what extent these specific impacts (i.e., predictions of the MProbit model), in combination with social inequality indicators, influence household's adaptation behaviour. The MLogit model is one of the most frequently used regression models in situations of unordered multiple-choice dependant variables.

The predicted probability of impacts on economic condition is highly correlated (correlation coefficient = 0.85) with the predicted probability of impacts on health. Since including both aspects in one model makes it impossible to isolate their respective effects on choice, we ran two response models in Stage II. The first one was with the predicted probabilities of impacts on economic condition and living environment and the second one with the predicted probabilities of impacts on health and living environment.

5.6 Results

Overall, the models were well fit as suggested by the significant Wald chi-square statistics (see Tables 5.4 and 5.5). The models did not suffer from serious multi-collinearity, and the robust standard errors were used to control for any heteroskedasticity.

5.6.1 Stage I: Multinomial Probit Model Results

Table 5.4 presents the results of the Stage I *impact model*. Factors found to have positive and significant influences on *economic situation* (deterioration) associated

Table 5.3 Definitions of variables

Variables	Definition	Stage I	Stage II
Outcomes			
Domains of climate impact in 2007			
Economic situation	1 = variable climate had a negative impact on their income and expenditure; 0 = otherwise	√	
Health condition	1 = variable climate had a negative impact on health of family members; 0 = otherwise	√	
Living environment	1 = variable climate had a negative impact on their living environment (especially housing and physical connectedness with outside); 0 = otherwise	√	
Response to climate change (2007–2011)			
Response	1 = migration; 2 = in situ adaptation; and 3 = non adaptation		√
Predictors			
Domains of climate impact in 2007			
Probability of impact on economic situation	Predicted probability [0, 1], calculated from the first stage model		√
Probability of impact on health condition	Predicted probability [0, 1], calculated from the first stage model		√
Probability of impact on living environment	Predicted probability [0, 1], calculated from the first stage model		√
Material inequality in 2007			
Poverty	1 = the household income is less than half of the average income in Shanghai/Nanjing.	√	√
Poor finance	1 = the family can barely or only just cover basic living expenses; 0 = otherwise (income and expenditure are both considered)	√	√
Renting house	1 = the household rents an apartment or rooms to live; 0 = otherwise	√	√
Per capita living area	m^2	√	√
Social status inequality in 2007			
Joblessness	1 = any household member of working age (16-64 years) does not have a job but is not a student; 0 = otherwise	√	√
Low-level occupation	1 = any household member has an occupation as elementary clerical, sales and service, labourers and related workers, 0 = otherwise		√
Intermediate-level occupation	1 = any household member has an occupation as tradespersons and related workers, advanced/intermediate clerical, sales and service; 0 = otherwise		√
High-level occupation	1 = any household member has an occupation as managers and administrators, professional or associate professional; 0 = otherwise		√

(continued)

Table 5.3 (continued)

Variables	Definition	Stage I	Stage II
Low-level education	1 = the highest educational attainment in the household is junior high school or below; 0 = otherwise	√	√
Power inequality in 2007			
Powerlessness	1 = there is no or very little chance for family members in the household to participate in policy-making process; 0 = otherwise	√	√
Availability of governmental policy	the number of government policies that relate to climate change and its impact: [1, 6]	√	
Information source	the number of information sources for climate related impacts: [1, 10]	√	
Access to information during climatic events	1 = obtained information on extreme climatic events during the occurrence of climatic events; 0 = otherwise		√
Access to information after climatic events	1 = obtained information on extreme climatic events after the occurrence of climatic events; 0 = otherwise		√
Never access to information on climatic events	1 = never obtained information on extreme climatic events; 0 = otherwise		√
Controls (2007)			
Views on climate variability	1 = the household views that climatic variability has continued since 2007; 0 = otherwise		√
Frequency of climate related events	1 = any form of climate related events (e.g., drought, coldness, typhoon, storm surge, flood, heatwave, salt water intrusion, smog, landslide) occurred frequently in 2007; 0 = otherwise	√	
City	1 = the household was in Nanjing; 0 = Shanghai or other places	√	√
Time to hospital	1 = it took more than 30 min to go to the closest hospital from home; 0 = otherwise	√	
Disability	1 = there was any disabled member in the household; 0 = otherwise	√	√
Elderly	1 = there was any member in the household who is 65 years or older; 0 = otherwise	√	√
Poor health	1 = there was any member in the household whose health status was very bad or bad; 0 = otherwise	√	√
dependency ratio	The ratio of those not at the working age (aged 15 years or younger, or 65 years or over) against the total number of household members: [0, 1]		√
Household head's age	Number	√	√

Table 5.4 Multivariate probit regression result: impact model

Variables	Impact on economic situation	Impact on health condition	Impact on living environment
	Coef.	Coef.	Coef.
Material inequality in 2007			
Poverty	0.181*	0.199*	0.230*
Poor finance	0.166*	0.182*	0.081
Per capita living area	−0.003	−0.002	−0.006*
Social status inequality in 2007			
Low-level education	0.021	−0.277**	−0.043
Power inequality in 2007			
Powerlessness	0.345***	0.298***	−0.043
Availability of governmental policy	0.096***	0.075***	−0.026
Information source	0.103***	0.085***	0.057**
Controls (2007)			
Frequency of climate related events	0.237***	0.548***	0.242**
City	0.557***	0.454***	0.258**
Time to hospital	0.171	0.228**	−0.169
Disability	0.110	0.384***	−0.020
Household head's age	0.003	0.006**	0.001
_cons	−2.154***	−2.434***	−1.591***
Obs.	1198		
Wald Chi^2 Statistics	280.23***		

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

with climate change include poverty, poor financial status, powerlessness, availability of governmental policies, information source, frequency of climate-related events in 2007, and residential location. Surprisingly, not only for families that have no or little chance to participate in policy-making processes, but also for those that know more about government policies on climate change, or have more information about climate change, their economic conditions are more likely to be affected by climate change. This is possibly because well-informed people have sufficient evidence to attribute the impact to climate change, while those less informed do not. Families living in Nanjing have higher risk of being negatively impacted by climate change than their counterparts living in Shanghai or other localities. This is because Shanghai is the most advanced megacity in China and has pioneered the adaptation of China's National Program for Adapting to Climate Change (IOSC 2011). Shanghai also has better environmental infrastructure and provides more public

services to its citizens than other cities. Such measures build capacity, which facilitates resilience to climate change (Shanghai Government 2011).

Factors significantly influencing the economic situation have the same significant correlation with *health condition* (decline). In addition to factors such as living far away from a hospital (i.e., taking more than 30 min by driving), having a low level of educational attainment, and having disabled family members and aged household heads are significantly associated with climate-related health deterioration.

The climate impact on *living environment* has a statistically significant correlation with some inequality factors and household characteristics. Those families with less income, smaller living area per capita, more information sources about climate change impact (for the similar reason to the influence of this factor on households' economic situation), having experienced more frequent climate-related hazards, and having lived in Nanjing have a higher risk of their living environment deteriorating.

5.6.2 Stage II: Multinominal Logit Model Results

We only present the results of the model with the impacts on economic condition and living environment because this model has a slightly better fit in terms of BIC (Bayesian Information Criterion) than the model with the impacts on health condition and living environment (Table 5.5).

A key finding is that all three domains of climate change impact on households are found to be statistically significant factors influencing people's choice (Table 5.5). Affected households are more likely to choose migration over non-adaptation (or in situ adaptation). The predicted change in probability of households adopting migration provides further insights into people's behaviour. In the baseline model, the climate impact variables are set as 0 to assess the effects of the climate impact variables on outcomes; the dummy variables are set as 0, except 'powerless' which is set as 1 (which is the value most observations take in the sample); and the other continuous variables are set at their respective means (which is the usual practice for continuous variables in generating predicted probabilities). Under the baseline, the probability of households' response to climate variability is estimated to be: 8 % for taking migration, 61 % for adopting local adaptation, and 31 % for non-adaptation. If households' *economic situation* and *living environment* are adversely impacted by climatic events, the probability for such a household to migrate (or adapt locally) increases by 12 % points (or 19 % points) compared to the baseline. This finding suggests that migration is an active strategy for urban households to cope with the adverse effects of climate change.

Material inequality is significantly associated with households' responses to climate impact. Households in poverty and having smaller per capita living area are less likely to adopt migration (or in situ adaptation) than non-adaptation. House

Table 5.5 Multinomial logit regression results: response model

Variables	Migration VS. Non-adaptation	Migration VS. In situ adaptation	In situ adaptation VS. Non-adaptation
	Coef.	Coef.	Coef.
Domains of climate change impact in 2007			
Impact on economic situation	9.409***	2.441***	6.968***
Impact on living environment	28.505***	−1.155	29.660***
Impact on health condition[a]	7.534***	2.281***	5.253***
Material inequality in 2007			
Poverty	−0.990**	0.072	−1.062***
Poor finance	−0.215	−0.556**	0.341
Resenting house	0.655**	0.564**	0.091
Per capita living area	0.047***	0.007	0.040***
Social status inequality in 2007			
Joblessness	−0.650*	0.004	−0.653**
High-level occupation	−0.678**	0.098	−0.775***
Low-level occupation	−0.551*	0.292	−0.843***
Low-level education	−0.159	−0.061	−0.098
Power inequality in 2007			
Powerlessness	−0.940***	−0.275	−0.665**
Access to information during climatic events	1.045**	0.238	0.806**
Never access to information of climatic events	0.785*	0.205	0.580
Controls (2007)			
Frequency of climate related events	0.718**	0.343	0.375
City	−5.104***	−1.698***	−3.405***
Elderly	0.903*	0.061	0.843*
Poor health	−1.529*	0.615	−2.143***
Dependency ratio	−1.780***	−0.124	−1.656***
_cons	−2.266**	−2.135***	−0.131
Obs.	1198		
Pseudo R^2	0.173		
Wald Chi^2 Statistics	238.55		

[a]Results of the impact of 'health condition' was obtained from an alternative second stage model which incorporates the independent variables 'living environment', social equality and other control variables. The coefficients of other independent variables in the alternative model are not reported here due to space limitation

*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

renters are more likely to migrate than adapt in situ or take no adaptive actions. This is in line with migration research elsewhere.

Among the social status inequality factors, joblessness and occupation type are found to be significant. Jobless households cannot afford to migrate or take adaptive measures locally. However, households are also more likely to remain in situ but do nothing if their family members have high-level occupations, compared to those whose members work in low- or intermediate-level occupations. High-level occupations have households with higher income and comprehensive social security benefits than do low- or intermediate-level occupations. This enhances a household's resilience to climate change and consequently reduces the urgency or necessity to migrate or adapt locally. Meanwhile, the households having low-level occupations also have a higher propensity to adopt non-adaptive measures than migration or in situ adaptation. But their behaviour is often due to the lack of resources.

Powerless households who indicate they have no, or very little, chance to participate in policy-making processes are less likely to migrate or adapt in situ. The time point of obtaining information of climate change also plays a significant role. Those households being provided with timely climate change-related information are more likely to adopt migration or in situ adaptation.

Households are more inclined to migrate than do nothing if they think climatic events occurred frequently in 2007 compared to the preceding years, live in Shanghai, have good health, and have a lower dependency ratio. These findings have important policy implications in that they suggest that urban households' mobility can be enhanced by increasing awareness of climate change.

In summary, if the households' economic and living conditions were affected by climate change impacts, such households are more likely to undertake migration regardless of their social status than those households not affected. Moreover, there is less propensity for the group of households with low social status (as indicated by multiple measures for material, social, and power inequality) to opt for migration. The probability of migration for such a group would increase dramatically (by 31 % points) compared to that for the group having high social status (37 % points) on the baseline level.

5.7 Discussion and Conclusion

Climate change particularly impacts groups experiencing economic hardship, have little chance to participate in climate policy-making processes, have little access to public information and services, and are living in rental accommodation. These findings are consistent with the view that adverse climate effects are more severe among the more economically and socially vulnerable populations, including migrants and those living in urban areas (Luber and McGeehin 2008). Our research

suggests that, in order to build the adaptive capacities of migrant households, given the sheer size of internal migration in the YRD, it is important to recognize the social inequities they face and provide opportunities, particularly equal access to employment, housing, health service, education, and enable genuine participation in policy-making. Migration needs to be better integrated into climate adaptation policies and planning. It is our position that an integrated view, which exposes the inextricably interwoven domains of climate impact, adaptation, social inequality, and human wellbeing, and by positioning the increasing role of migration within their sphere, will assist policy-makers and planners to build ways towards sustainability.

An important limitation deserves mention. The sample size of our study is not large enough to include sub-groups with more nuanced characteristics. For example, small sample size makes it difficult to distinguish between different forms of migration in terms of duration (e.g., permanent, temporary, circular). Addressing different patterns of migration is of importance in planning and managing population mobility as each represent different levels of adaptive capacity. In light of this limitation, more detailed patterns of migration will be required in future modelling efforts.

The results of the study provide evidence that three dimensions of social inequality—*material inequality*, *power inequality*, and *status inequality*—have significant association with major domains of adverse climate impact experienced by urban households and their subsequent responses to these impacts. The findings suggest that the understanding of social inequality in urban settings of China should not be confined to the sphere of *material inequality* (especially income inequality) only. To build resilience to climate (environmental) change in the YRD, government policies need to go beyond efforts to minimize income disparities and should address all dimensions of social inequality. Chinese people have not been effectively and sufficiently involved in the process of public decision-making. The situation in the YRD is exacerbated by massive inflows of migrant workers who have less awareness of and accessibility to public policies than local urban residents, whilst they struggle to earn a basic living. Actions need to be taken to identify who has no or little information on climate change and its related policies, and the barriers to getting this information. It is also imperative to take steps to improve meaningful participation of the public in the public-policy arena. Occupation has been widely used as the key indicator of social status in China (Lu 1989, 2001). But occupation-based inequality is not limited to income inequality alone. There are important social and power dimensions. Developing a more equal social security system, which is more widely available than the present system based on employment status and locality, is key to improving the status of vulnerable groups. In areas influenced by climate change there is a need to put in place specific policies and programs which provide real opportunities and capabilities for people to move or alternatively increase their ability to take actions to adapt to climate impacts in situ. These initiatives need to be sensitive to class differences.

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Chapter 6
Drought, Social Inequalities, Adaptation, and Farmers' Mobility in the Konya Plain of Turkey

Gülçin Erdi Lelandais

Abstract Climate change brings different challenges to different countries, and to different groups and regions within countries. In Turkey, drought and desertification are regional challenges that are exacerbated by climate change. A coordinated and realistic public policy that takes into account the social consequences of drought does not exist. As a result, drought adaptation typically takes the form of spontaneous, short-term measures that sometimes produce new social inequalities in addition to existing ones. Using a case study of the Konya Plain, I describe the physical impact of drought and climate change in the region, provide examples of the types of social inequalities that exist, and show how these inequalities influence the adaptive capacity and livelihoods of farmers exposed to desertification and drought, with a particular focus on mobility as an adaptation process.

Keywords Agricultural adaptation · Desertification · Konya plain · Institutional adaptation · Drought migration · Social inequality · Turkish agriculture

6.1 Introduction

The Konya Plain has naturally dry climatic conditions. Recent studies suggest that since the 1990s there has been an increase in the frequency of droughts in this region (Turkish Parliament 2008 [61]). This trend presents considerable challenges for the Turkish agricultural sector, especially with the water-stress projections for

This chapter is based on the findings of EXCLIM, a collective research project. The fieldwork in Konya was conducted in the spring of 2010 and summer of 2012 to learn the perception of farmers to climate change and the kinds of adaptive solutions they have invoked to successfully produce crops.

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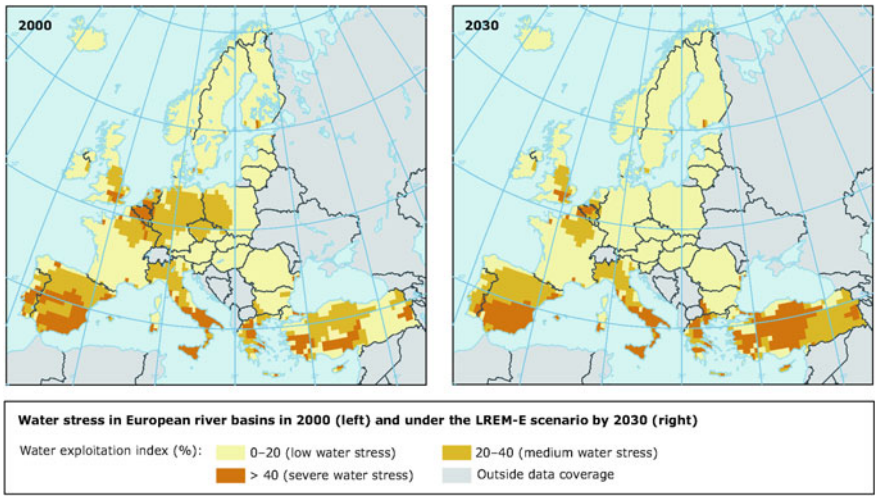

Fig. 6.1 Current water stress in European river basins in 2000 and under the LREM-E scenario by 2030 European Environmental Agency http://www.eea.europa.eu/data-and-maps/figures/water-stress-in-europe-2000-and-2030, consulted on 1/06/2010

the Mediterranean region (see Fig. 6.1). For farmers on the Konya Plain, who are already vulnerable to drought, soil erosion, and desertification, there is a growing risk that there will be a decrease in agricultural productivity, which will be exacerbated by the lack of adequate irrigation. Turkish officials are concerned that increased water scarcity could aggravate social tensions (Ministry of Environment and Forest 2007).

Desertification and soil erosion on the Konya Plain are longstanding problems influenced by changing weather and climate trends, and by changing land-use patterns. Since the 1950s, the region has experienced highly variable weather, and it is common for the area to go 5–6 months without rain in a 2–3 year period. The geospatial extent of desertification has expanded over the last 30 years, especially in the south-eastern part of the Konya Plain (see Fig. 6.2). The map on the left shows

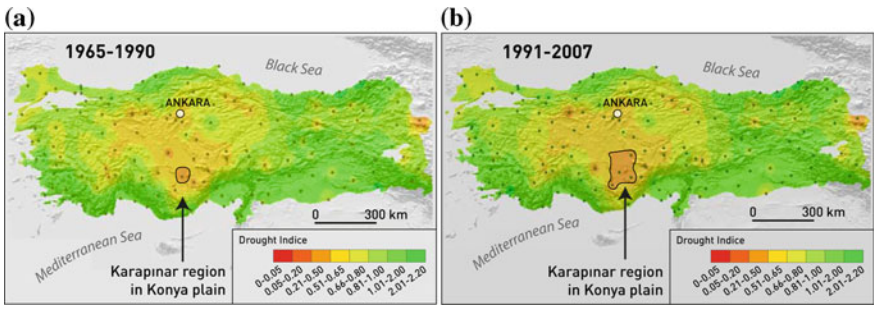

Fig. 6.2 Progression of desertification in Konya. Maps by Florence Troin

dry areas in the region from 1965 to 1990—the small, circled, orange area shows where desertification had taken place. In the map on the right, the geographical expansion of this area is visible. Although Turkey's national report on climate change attributes increased desertification and the intensification of drought in this region to climate change, the situation is made worse by anthropic factors (Türkeş 1999, 2003).

Despite limited water resources, agricultural practices and grazing in the Konya region have long been unstructured and unregulated. Many farmers continue to grow crops using traditional techniques such as continuous and massive irrigation. In recent years, these farmers have begun to construct illegal water wells for irrigation. In 2008, there were 41,071 unauthorized wells—representing 69 % of the total number of wells in the region (Kol 2009). This unregulated use of underground water resources has contributed to a drop in the water table of 2–3 m per year. Another consequence has been the appearance of over one hundred large sinkholes (known in Turkish as *obruk*) in the Konya region. Some of these sinkholes are up to 70 m in diameter—big enough to swallow entire fields (see Fig. 6.3). The absence of meaningful government environmental-management policies, apart from modest reforestation programmes, has exacerbated the impact of climate change, and inefficient land and groundwater use. As a result, agricultural adaptation to climate variability and change in the Konya Plain is undertaken autonomously by the region's farmers, according to their socio-economic resources and capabilities.

The data and hypothesis presented in this chapter are gleaned from empirical research conducted between 2010 and 2012 that looked at actors involved in adaptation process and their networks, and their connections at the local and national level. The study was carried out in two phases. In-depth interviews were conducted in Ankara with individuals in the climate change department of the Turkish Ministry of Environment and Forest and with representatives of key

Fig. 6.3 Obruk Yarımoğlu—18 km from Karapınar. Photo by author

organizations involved in climate-change adaptation, such as the United Nations Development Programmes. In the second phase, local people in Konya were interviewed to obtain data on perceptions of climate-change risks, and planned or spontaneous migration that may be associated with these risks. This data was supplemented with and cross-checked against information from official reports, statistics, and action plans on climate change generated by the government of Turkey and UN agencies.

Key findings from this study now follow, with an emphasis on the connections between social inequalities in the region and climate and land-use trends, and emerging migration patterns. I begin by describing the current agricultural system as well as the social composition of the farming population, and the types of adaptation policies and programmes that have been initiated in the region. This is followed by an analysis of the environmental and social impacts of climate change in the Konya Plain and their implications for mobility of farmers and their agricultural production. I conclude by suggesting that migration in the Konya Plain is strongly influenced by social injustice and inequality in the region.

6.2 Social Composition of Farming Population, Current Agricultural System, and Social Vulnerability to Climate Change

As in many parts of rural Turkey, the farming population on the Konya Plain consists of a large number of small-scale farmers and a smaller number of landowners who operate large (>30 ha) farms. Small-scale operators include people who live on the plain year-round as well as those who migrate to urban areas in winter, when there is less agricultural activity. Although fewer in number, the activities of large farm operators generally determine the agricultural trends of the region.

In the early days of the Turkish Republic (1930s), a key objective of the new government led by Mustafa Kemal Atatürk was to equitably distribute farmland throughout Turkey. The aim was to allow farmers to independently support their families through cultivation of their own plots of land. This initiative was launched in response to the disproportionate political and economic influence of feudal-style landlords who resisted the foundation of the republic (İnan 2005). However, despite the new government's efforts, much of the country's farmland (especially in the south-eastern Kurdish regions) remained in the hands of landlords, a pattern that continues today. This concentration of agricultural land ownership is at the root of the social and economic inequality in the Konya Plain. It also gives rise to three distinct social groups or classes: large-scale land owners, small-scale land owners, and landless farmers. The number of people in the last category has increased significantly as more and more small-scale farmers sell their land and relocate to

urban areas or leave to seek work in commercial greenhouses along Turkey's southern coast.

Turkish agricultural policy creates few rights or obligations for farmers and, where these do exist, they are difficult to implement and enforce. Further, there are no formal, regionally specific agricultural plans, which has important implications in a region like the Konya Plain where common groundwater resources are limited. Consequently, farmers make crop choices according to potential profitability and not according to regional environmental considerations like dryness. For example, many Konya farmers plant corn or sugar beets despite the high water requirement of these plants. As one farmer interviewed for this project explained:

> "The farmer has no choice. Because of despair and the need to live in the moment, he chooses corn, sugar beets or sunflowers. Therefore, he must use ground water. It is not possible [to survive] any other way. If the state would only provide financial support for grain production, we would have nothing to do with sunflower or corn. [But] because the price of wheat is so very low, nobody chooses it."[1]

The government tries to support Turkish farmers in three ways. There is a crop insurance system to mitigate the effects of natural disasters, financial support for training programmes and subsidies for seed purchases, and low-interest loans for farmers. However, as well-organized as these programmes appear, they do not function efficiently or equitably. For example, crop loss due to drought in a given year will not always be compensated by insurance. Only in cases of extended, multi-year droughts will the state consider compensating farmers. Further, the different geographical circumstances of Turkey's regions are not taken into account. Farmers in the Konya Plain who lost farmland to *obruks* (sinkholes) received no compensation, because *obruks* are not considered a natural disaster. Increasingly, farmers do not report crop losses or land damage to the authorities as they believe no useful action will result.[2] The government's low-interest loans programme is complex and inaccessible to all but a few, large farm operators. In principle, the government will loan farmers up to 5000€ to be repaid over a seven-year period (Official Legal Journal 2012). However, these loans come with risks that discourage most farmers. As explained by the president of the Agricultural Chamber of Karapınar in the Konya Plain:

> "First of all, the loan is actually a mortgage. It means that if you cannot pay it back, you can lose your land. It is actually very risky and if you are not certain to make a good harvest because you don't have enough farmland or don't have good equipment or irrigation, you don't want to touch these loans. For example, we have 18,000 members in the region [but] only 500 farmers use these loans. The system is not suitable for small-scale farmers, it favours big farm owners."[3]

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[1]Interview with a farmer from Isli village in Karapınar in June 2014.

[2]Interview with a representative of TEMA (Association to combat erosion) in Karapınar in June 2012.

[3]Interview with Hikmet Bozaklı, president of Karapinar Chamber of Agriculture, in Karapınar in June 2012.

As a result, the government's farm programme system best supports large farm operators, especially those who have strong connections with the food industry. For small operators, a vicious circle has emerged that is exacerbated by climate trends. As droughts become more frequent and intense, small farmers experience crop losses more often and increasingly find themselves unable to meet financial obligations, without any institutional support to turn to. Farmers in one of the study villages explained:

> "To keep us farming, the government has encouraged us to get bank loans. When there was the great drought of 2007, nobody got an adequate harvest. So, we could not pay the debts. They froze our debts but they are still there. We are not like you [i.e., the researcher]. We don't have a salary. Our money comes only from our crops. It is never stable. However, we have needs which remain constant. Children must be sent to school, food should be bought for the cows… We are indebted up to the birds in the sky. The system is bad, policies are wrong…"[4]

Farmers who cannot pay their debts typically sell their land and migrate to urban areas to find a job. Alternatively, they stay and become employees of the large farm operators in the region. This reinforces the increasing concentration of farmland in the hands of a few landlords.

Vulnerability to environmental change has many dimensions. There is the physical vulnerability of people and/or their property; social vulnerability (e.g., inclusion in strong local communities); and economic vulnerability (e.g., loss of jobs, livelihoods, and other assets) (EXCLIM 2013 [63]). In the Konya Plain, drought exacerbates the social and economic tensions associated with long-term environmental degradation. The degree to which the physical impact increases the economic and social vulnerability of the farming population depends on the intensity and duration of the drought. The success of the farmers' adaptation is linked to agricultural traditions in the regions. Often when there are extended periods of drought, higher levels of soil erosion and desertification take place. This means that not only do farmers' short-term incomes decline, the longer term productivity of farmers' land also declines. This in turn increases the importance of introducing new irrigation techniques and methods on a wide scale, and improving water-management practices.

Other factors also put pressure on farmers. The demand for irrigation is increasing across the region, but aging and inadequately maintained infrastructure means water use is often inefficient. The absence of financial or other incentives means that farmers don't practice water conservation despite the growing pressure on water resources. Fluctuations in the price of oil have also had an impact on farm operations. Rising costs in recent years have made pumps and other equipment more expensive to operate, which erodes net incomes.

Climate trends suggest the pressure on the region's farmers will only increase in coming decades. Dellal et al. (2011) combined the Turkish Agricultural Sector

[4]Focus-group interview with farmers in a village in Konya Plain on 14 April 2010.
*Name of the village is not given to protect the anonymity of interviewees.

Table 6.1 Population distribution in Konya, 2000–2009

KONYA	Urban population	Rural population	Total
2000	1294,817	897,349	2192,166
2009	1450,682	541,993	1992,675

Model (TASM) with climate projections to 2050 using the Hadley Centre Coupled Climate Model (HadCM3) to identify possible national and regional changes in Turkey's productivity, arable lands, and production patterns for five crops: wheat, barley, maize, cotton, and sunflower. Calculations were made to predict possible shifts in a producer's surplus, and in a consumer's surplus and prices. Based on this analysis, a decline of 2–13 % in productivity throughout Turkey was projected (Dellal et al. 2011). In central Anatolia, where the Konya Plain occupies the majority of territory, the decline is expected to be between 7.3 and 12.5 % depending on the product.

To make matters worse, these downward trends will be added to declining agricultural productivity, land degradation, water scarcity, and unequal sharing of water resources. These existing factors already generate social tensions and conflicts between villages over sharing of underground water resources (Kol 2009). The cumulative effect is a decline in the size of the rural population in the Konya region, growth in Konya's urban population, and an overall decrease in the population of the region as a whole (Table 6.1).

6.3 Adaptation and the Institutional Context in Konya Plain

For Konya's farmers, the choices for adaptation to drought and desertification are to either invest in new or additional irrigation technology, particularly drip-irrigation systems, or if they lack the capital for such investments, to leave farming and migrate to urban areas in search of wage labour opportunities. Governments and NGOs have devised numerous programmes over the years to increase farmers' adaptive capacity, with mixed results. In 1998 Turkey became party to the United Nations Convention to Combat Desertification, and in 2005 a national action plan was launched with subsequent regional plans, including one for the Konya Plain (known by the acronym KOP). The action plans have been coordinated by the Ministry of Environment and Forest[5] in conjunction with other state ministries,

[5]The Ministry of Environment and Forest (MEF) was split up in 2011. Forest issues were combined with water management to form a new ministry. And the former MEF became the Ministry of Environment and Urbanism which was given sole responsibility for the environment. Urbanisation and urban planning are the priority for this ministry; environmental issues and climate change are a secondary priority. The Department of Climate Change (CC), founded on 28th July 2010, was taken over by the Department of Meteorology on 1st February 2013, and the

universities, scientists, and NGOs. The action plan targets inappropriate land use, degradation of forest and pasture areas, inadequate political and legal arrangements, lack of knowledge and awareness of climate change and water use, and rural poverty. These factors are collectively seen as the cause of the erosion that affects 86 % of Turkey's land (Ministry of Environment and Forest 2008). Climate change and its impacts are not explicit targets of the action plans.

NGOs play important roles in the KOP action plan. The three most important of these agencies are Greenpeace, World Wildlife Fund (WWF), and the Foundation to Fight against Erosion, Deforestation, and Protect Natural Heritage (TEMA). Funding for programmes under the action plan comes from the United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), and a number of Western donor countries. Action plan programmes include the development of drought-resistant seeds and teaching farmers how to install drip-irrigation systems. Directors of the plan hoped that these programmes would reduce the out-migration of farmers by supporting agricultural livelihoods, while simultaneously preserving water resources on the Konya Plain and preventing the region's lakes and surface water from drying out.[6] National reports from 2007 to 2013 list a number of strategies for building adaptive capacity to mitigate future climate change. These include land-use management improvement programmes; the promotion of technological improvements in water transportation and distribution systems for irrigation and settlements; and improved management of water demand and allocation among users. Of particular relevance to agriculture, adaptation measures suggest the development of techniques for non-traditional use of water resources, and the improvement and development of new plant species that can better withstand drought and salinity—high quality yields with low-quality water (MEF 2007; MEUP 2012; 2013). Most policies and programmes that stem from the KOP tend to concentrate on land use, land preservation, and sustaining the existing agricultural system on the Konya Plain. In theory, these policies and programmes are supposed to consider farmers' well-being, creation of employment opportunities, welfare of families and children, and possible linkages of these factors to migration. However, even with the assistance of NGOs, many of the programmes still entail high costs for the farmers, as described in our earlier example of expanding the use of drip irrigation.

At the local level, public and private actors continually lobby authorities to finance KOP programmes. One initiative consists of twelve local projects that collectively would create a regional irrigation scheme for the entire plain while simultaneously meeting drinking water needs in the region and producing

(Footnote 5 continued)

Climate Change Adaptation Branch of the CC department was closed on the same date. With these changes, Turkey reverted to climate-change management and practices that were in place before 2010; significant bureaucratic progress was lost; and CC department staff was re-deployed to other departments.

[6]Interview with Mehmet Babaoğlu, president of Karatay University and lead for the Action Plan for Konya, 14 April 2010, Konya.

hydro-electric power.[7] Called the *Mavi Tünel* (Blue Tunnel), this initiative would see the construction of two dams on the Göksu River in southern Konya and divert water through a 17 km tunnel to the Konya Plain. This project is almost finished and contractors expect to transfer the collected water soon to Konya Plain.[8] It is, however, not clear that there has been adequate consideration given to the impact of this initiative on the ecosystem and on neighbouring regions, or the long-term sustainability of the initiative (Mutlu 2011).[9]

Informants, with whom I spoke during the course of my research, explained that an ongoing challenge to advancing institutional initiatives under the KOP is that responsibility for funding and implementation is fragmented across multiple sectors and agencies. Most of the responsibility and decision-making power is concentrated at the national level, with local authorities involved only once decisions have been made and are ready to be acted on. The result is national, regional, and local decisions are being made in parallel and cancelling each other out. For example, one official based in Konya explained:

> "For years we've been working on the action plan for the drought in Konya. Several associations, organizations such as the Chamber of Commerce, researchers from the University of Selçuk, and the governorship partnered to develop this plan. Nevertheless, we are still waiting for funds. We were told that this plan will be integrated into the current period of economic planning but we realized that this was not the case. The plan now waits at the National Planning Institution for approval. Priorities of Ankara (i.e., the national government) and those of Konya do not always match up, even though the bells ring danger for agriculture in Konya."[10]

As a consequence of the inability of national and regional institutions to implement effective responses to drought and desertification, farmers must undertake their own strategies for adaptation and survival. One of these strategies is migration, and it is here where social injustice and inequality becomes most apparent.

[7]Interview with the (former) governor of Konya, 13 April 2010, Konya.

[8]For more information about this project, see Konya News, "*Mavi Tünel ne zaman bitecek*?" (When will the Blue Tunnel be finished?) at http://www.konyahaberler.com/konya/konyadaki-mavi-tunel-projesi-ne-zaman-bitecek-h13726.html.

[9]For different views on the project, see interview with Professeur Nüzhet Dalfes entitled "The climate may change, but Turkey's policies do not" in Today's Zaman newspaper online at: http://www.todayszaman.com/national_the-climate-may-change-but-turkeys-policies-do-not_153800.html.

[10]Interview conducted with a local official of the Ministry of Agriculture on 13 April 2010, Konya.

Table 6.2 Migration from Konya (2012–2013)

	Population of Konya-origin migrants in selected cities
ANKARA	6898
ANTALYA	5417
ADANA	1212
ISTANBUL	6090
IZMIR	2952
SUB-TOTAL	22,569
TOTAL FOR TURKEY	55,006

6.4 Injustice and Inequality: Reasons for Migration in the Konya Plain

Migration patterns on the Konya Plain are a direct result of the uneven distribution of socio-economic resources within the agricultural sector. This inequity affects both the farm families' resilience and their vulnerability. At the local level, an obvious question is why some households migrate while others do not. In Konya, socio-economic status, age, and location are particularly important when it comes to adaptation options and decisions to migrate. There are clear differences among farmers in terms of status, power, and resource availability. Some of the differences can be attributed to the low level of education among small-hold farmers[11] and the consequent lack of awareness of policies and programmes that might help them adapt. Low levels of education might also contribute to the absence of collective action and to the fatalistic attitude among many farmers that drought is the will of God.

There are four general ways in which the farming population uses mobility and migration as a means to cope with and adapt to drought. One strategy is to rent their land to other farmers and use the money to finance a move to the city. A second strategy is seasonal migration to the city of Konya during the winter, returning to the farm in the summer. A third one is to permanently relocate to Konya or Ankara. This is often the option of choice for farmers who have lost ownership of their land, and it is this group who end up working in low-wage occupations in the city. A final option is to migrate out of central Anatolia indefinitely and go to another agricultural region such as Antalya or Adana along the Mediterranean coast to work in the greenhouses. Table 6.2 shows some of the key destinations of migrants from Konya during 2012 and 2013. Although not directly related to drought, children of farmers increasingly do not want to work in agriculture and tend to leave the region to live in cities once they are old enough to do so. This further reduces the agricultural population.

[11]In Karapınar, one of the most rural and agricultural areas of Konya, 41.5 % of the city's population spent only five years at school; 69.7 % of it has a primary education diploma; and 4.5 % of the Karapinar's population is illiterate.

Although out-migration may seem a logical solution to the situations in which farmers find themselves, most farmers we encountered in our research are strongly attached to their land and are pessimistic about their prospects in the city. Most would not consider migration if there were other options or better support from institutions. The following quote is from a participant who reflects this commonly held view.

> "What can we do in the city? There is no other business there [for us]. How can we start a new job at our age, we cannot adapt to the city. What will our children do? At least here (on the farm) they can get bread and cheese to eat, while in the cities they could not find even that. The reality is that it is God who decides. If He would only send us the water, then we could continue to cultivate the land, as we work hard and we are aware of the risks."

Also noteworthy is the high level of solidarity in rural areas where extended family relationships are strong. These social networks are maintained between family members in the villages and those members who have relocated to the cities. Farmers who are considering migration in response to drought risks often express an interest in joining relatives in cities like Konya. Migration along social networks is not sudden or massive, but incremental and subtle. It often takes place through the initiative of an individual family member who leaves, then over time, other family members follow.

Because so much migration takes place along family networks, government authorities are content to be silent on the issue. The volume of this type of migration does not serve as a stimulus for government action to address the underlying inequalities that give rise to migration. In some ways, social networks serve as a substitute for more expensive state support for Konya's farming population, and migration does provide many families with the chance for short-term survival. Even so, public institutions cannot ignore indefinitely the need for a public policy to reduce socio-economic inequality in the Konya Plain and better prepare the farming population for future droughts due to climate change.

6.5 Conclusion

Our research in the Konya Plain region shows that, while publicly Turkey maintains the semblance of being actively engaged in planning for drought, desertification, and climate change, the rhetoric is not reflected in effective, concrete action. Many problems persist with the implementation of policies, laws, and action plans. Logistical and financial resources are lacking, and enforcement of water-management regulations is weak. Formal drought insurance schemes for farmers are lacking. There is often confusion between local and national institutions in terms of responsibility and authority. Local individuals have no power to initiate specific action; instead, all activities must be approved at the national level. In the absence of changes to the current institutions and their processes, it is difficult to see how the situation of farmers in the Konya Plain is going to change. The

combination of existing social inequalities and increased environmental risks due to climate change will only make farmers more vulnerable, and high levels of out-migration from the region are going to continue. For that reason, a decentralized, more democratic resource-management model of governance is a worthwhile and necessary goal.

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Chapter 7
Environmental Influences on Haitian Migration to Canada and Connections to Social Inequality: Evidence from Ottawa-Gatineau and Montreal

Amina Mezdour, Luisa Veronis and Robert McLeman

Abstract This chapter examines the extent to which environmental factors and social inequality in Haiti interact to influence international migration from that country to Canada. With its long history of deforestation, land degradation, soil erosion, and surface water pollution, Haiti is often cited as an example of environmentally induced migration. Canada has been a significant destination for Haitian migrants for many decades, and there are large, well-established Haitian-Canadian communities in Ottawa-Gatineau and Montreal. We have worked with members of these communities on an exploratory study to document how environmental events and conditions in Haiti have directly or indirectly influenced their decisions to migrate to Canada. Using a participatory, qualitative, mixed-methods approach, we found that environmental degradation, urban ecological decline, and extreme events interact with social inequalities in Haiti to influence international migration to Canada in subtle yet observable ways.

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Keywords Haitian diaspora · International migration · Rural-urban migration · Deforestation · Urban ecological decline · Haitian Canadians

7.1 Introduction

Haiti is often described in academic and popular reporting as a *hotspot* of environmental migration (e.g., Diamond 2005). This is not surprising, given its long history of deforestation, land degradation, soil erosion, and surface water pollution, punctuated by disaster events such as frequent hurricanes and the terribly destructive 2010 earthquake. Some researchers have suggested that Haiti is an example of what might be expected elsewhere in the world in coming decades as the impacts of anthropogenic climate change take hold, and how international policies are urgently needed to protect environmental refugees (Myers 2002; Doran 2011).

Haiti has been the subject of empirical studies about internal displacements caused by natural disasters (Lu et al. 2012), of modeling exercises to identify international destinations for out-migration (Amuedo-Dorantes et al. 2010), and of broader studies of the country's diaspora (Mooney 2009). However, there are notable gaps in the literature such as the extent to which environmental conditions in Haiti influence international migration, and related questions of how social inequality within Haiti intersects with environmental conditions to shape international migration patterns and behaviour. It is important to address this gap, in order to move beyond normative descriptions of (and prescriptions for) *environmental refugee-ism* that have been applied to Haiti and other countries facing similar environmental and development challenges. By so doing, we will then be able to generate international policies and programs to better serve the interests of international environmental migrants.

Between 2004 and 2013, more than 32,000 Haitians migrated permanently to Canada (Citizenship and Immigration Canada 2014). This number is considerably smaller than the number of Haitians who migrate each year to its contiguous neighbour, the Dominican Republic, or to the United States. Nonetheless, Canada is a significant destination choice for international migration from Haiti. Given the scale and lengthy history of Haitian migration to Canada, it is reasonable to assume that, if environmental conditions in Haiti have any influence on long-distance international migration, Haitian Canadians could speak knowledgably about it. Much of the literature on international environmental migration focuses on short-distance movements between contiguous countries. But scant work has been done on this topic from the perspective of migrants living in a distant receiving country (Obokata et al. 2014). With this in mind, we initiated an exploratory study that used participatory research methods to engage members of the Haitian communities in Ottawa-Gatineau and Montreal. Our aim was to document qualitatively how environmental events and conditions in Haiti might have directly or indirectly

influenced their decisions to migrate to Canada. In doing so, we uncovered information that reveals how environmental conditions in Haiti interact with social inequalities to influence migration in subtle yet important ways.

7.2 Methodology

Given the exploratory nature of this research and its emphasis on understanding the perceptions of migrants and their personal migration experiences, we used a qualitative methodology. We did this to gain insight into the economic, political, social, and cultural context of participants' migration decisions. Our first step in 2012 was to initiate semi-structured interviews, in which primarily open-ended questions were asked of twelve key informants. These interviewees were frontline workers and managers of programs that provided services to new arrivals from Haiti, and leaders of Haitian community organizations in Ottawa-Gatineau and Montreal. The interviews allowed us to better understand general trends in migration within the Haitian community and to develop sets of questions for subsequent focus group discussions with recent Haitian immigrants. These key informants also served as facilitators for developing contacts within Haitian community networks. With their help, we organized four separate focus group discussions in early 2013 with twenty residents of Ottawa-Gatineau who had immigrated to Canada between 2000 and 2009. We selected this particular time period because we wished to avoid having the events of the 2010 earthquake overwhelm the discussion and skew the project findings toward this single geotechnical event. A random or representative sample was not possible given the nature of the project, but we nonetheless deliberately sought to include in our focus groups a mixture of people from a range of socio-economic backgrounds, ages, and gender, and include people who had come from Haiti under various immigration categories.[1] This was important to identify potential differences in the influence of environmental factors on immigration strategies for different groups and individuals. Focus group participants completed short questionnaires about their age, marital status, education level, and immigration category, which provided coarse data about the socio-economic classes represented within the groups.

We augmented the focus group discussions with seven in-depth personal interviews with Haitian immigrants in Montreal, home to the largest and most diverse Haitian community in Canada. We deliberately selected interviewees who originated in rural areas of Haiti because most focus groups participants were from urban areas and, as we detail below, focus group participants felt that environmental challenges in Haiti have a stronger influence on rural out-migration. Again we used

[1]Canada's *Immigration Act* specifies a number of different categories under which people may legally immigrate to Canada, including skilled workers, family reunification, and refugees, among others.

semi-structured interview questions that allowed participants to explain in greater detail the reasons for their migration decisions and strategies, and how environmental and other factors influenced these decisions. Short questionnaires with demographic and socioeconomic information were also collected from the individuals we interviewed.

7.3 Research Findings

Of the 27 participants, 10 were women and 17 were men (see Table 7.1). All but one participant arrived in Canada between 2001 and 2009 (i.e., before the 2010 earthquake). Some differences in the levels of education and immigration categories distinguished individuals who participated in the focus groups from those who participated in the semi-structured personal interviews. The former included mostly educated urbanites. This was reflected in their higher levels of education and the fact that 12 came to Canada as skilled workers or the *family class* spouses of skilled migrant workers. Six participants immigrated to Canada as refugees and two others

Table 7.1 Demographic characteristics of focus group and personal interview participants

Demographic characteristics	Focus groups (N = 20)	Personal interviews (N = 7)	Total
Gender			
Female	6	4	10
Male	14	3	17
Age			
25–34	6	2	8
35–54	12	3	15
55–64	2	2	4
Education level			
Attended and/or completed high school	7	4	11
Attended and/or completed college/university/post-secondary	5	3	8
Attended and/or completed graduate school	4	–	4
Professional diploma	4	–	4
Immigration category			
Economic immigrant (skilled worker)	6	3	9
Family class	6	1	7
Refugee/asylum seeker	6	3	9
No response	2	–	2
Year of arrival in Canada			
2001–2009	20	6	26
Before 2001	–	1	1

declined to indicate their immigration status/category. In contrast, all seven personal-interview participants came originally from rural areas in Haiti and therefore displayed lower levels of education. For migrants originating from rural areas, the immigration categories showed greater variance.

Most participants described their principal motivation for migrating to Canada as economic and/or social. None stated that environmental factors (e.g., tropical storms, floods, erosion, land degradation, etc.) were the principal reason for leaving Haiti. Instead, what emerged from the focus group discussions and personal interviews was that environmental factors have a more subtle, indirect influence on migration within Haiti and to international destinations like Canada. Four particular themes emerged which, when taken together, describe the complex interaction of environmental, social, and economic forces within Haiti that may contribute to international migration of certain groups and individuals.

7.3.1 Deforestation

The first recurrent theme was the impact of severe deforestation on life chances in Haiti. Participants described how this is the principal environmental challenge faced in their home country,[2] and that it has direct implications on socio-political and economic conditions. Forest clearance has triggered soil erosion and land degradation that has made agriculture less productive and, in some regions, unfeasible. Participants explained that this in turn leads to recurrent landslides and flood events, especially during heavy tropical rainstorms. Food insecurity has grown steadily, and the rural population has become increasingly impoverished.[3] Deforestation is driven in large part by charcoal production, which is the principal household fuel source for heating and cooking. Trees are valued primarily as a source of short-term revenue, especially given the rising cost of charcoal across the country. Deforestation is therefore inextricably linked to economic processes and energy consumption patterns in Haiti. For the rural population, forest clearance provides some individuals with an opportunity to realize greater short-term incomes than is possible through farming—the revenues from which are inherently uncertain given their dependence on multiple factors such as water availability, soil fertility, weather conditions, and market prices. These ideas were expressed by a number of participants, with the following two sample quotations drawn from remarks made by participants originating from rural areas:

> When it rains, it's like emptying the land, that's causing soil erosion because the people cut all the trees. Why? Because, sometimes, people don't have any money and when there is a tree, they will cut the tree to make charcoal and they will sell it in order to have money to support their family. (Interview 1, La Chapelle)

[2]Only 2 % of Haiti's original forests remain today (Dolisca et al. 2007).

[3]60 % of the Haitian population lives in rural areas (IFAD 2008).

> I've cut oak trees where I lived to make charcoal. Yes, even mahogany, you know the wood from which nice furniture is made, we cut it where I used to live. But we don't have a choice (*nervous laugh*). One has to live! When having to choose between a good dish of vegetables and meat, or a mango, we choose the former. The mango is only vitamin C and provides nothing else compared to the dish which gives you protein, all the nutrients. That is how we think. (Interview 2, Fort-Liberté)

The majority of the participants, particularly those from rural regions, suggested that political decisions made by the Haitian government contributed to increasing rates of deforestation. Others attributed deforestation to decades of weak government and the absence of a strong central government. Still others spoke of a lack of policy, government support, and infrastructure to support farmers. The inability of the government to implement reforestation strategies was another concern.

Participants also stated that rural incomes were undermined by tariff-free food imports especially from the USA, with which they couldn't compete. This creates a vicious cycle in which cutting the few remaining trees becomes the only viable livelihood opportunity in rural areas. The following quotations illustrate this point:

> Since the market is filled with American rice, Haitian farmers no longer plant [rice], because it is cheaper to buy imported rice than rice produced in Haiti. So they [Haitian farmers] can no longer sell their crop [and have lost their livelihood]. Until now, we have been saying that Haiti is predominantly an agricultural country, but Haiti is dependent on other countries to feed its population. (Quote from focus group 3)
>
> People depend on livestock like pigs to send their children to school; same with rice. So we have no rice to harvest, we have no pigs [because of a government decision to cull all pigs to eliminate a virus], we turn to cutting wood [to make charcoal and sell it]. So this is the environmental problem. Our environmental problem in Haiti is above all a conjuncture of bad political decisions. (Quote from focus group 1)
>
> It is clear that the [Haitian] government is not doing its job. People are forced to use charcoal made with wood. It is poverty that pushes people to cut wood to make charcoal because the government is not there for them. And when the trees are gone, and there is no tree replanting; and if there is no tree planting, it causes [environmental] problems. (Interview 4, La Chapelle)

7.3.2 Rural Out-Migration in Haiti

In the view of participants in our project, deforestation combines with poverty and social inequality in rural areas to drive ever-growing rates of rural-to-urban migration within Haiti. Participants explained that leaving the countryside for urban centres is a common adaptation strategy for rural households. It is a response to their extreme vulnerability to deforestation and related environmental problems such as soil degradation, landslides, and erosion. Participants stated that rural migrants are seeking environmental, social, and economic security in the cities. This is evidenced in the following quote:

> In our country, there are [rural] areas where there are no roads, people have some food [from agriculture], but the government doesn't build any roads. So there are no roads. There are regions where people need water, but there is no water. It is not for the population to

> build roads and all these things that are missing, this is the issue for me. Rural areas need to be developed. They [the government] did not really work to develop [the rural areas]. People think that if they move to the capital the conditions will be better, but in the capital there is overpopulation, there are slums everywhere. (Quote from focus group 4)

The central government is unable to provide basic social services in rural areas, so in addition to seeking employment, people migrate to cities to access services such as education.

> There are schools and health clinics [in rural areas], but when we need more important services, we go to the city. Especially for school, to continue with university. (Interview 1, La Chapelle)
>
> One had to go outside [my village] to access some services. From where I come, we only had an elementary school. To follow secondary classes we had to go to Cabaret. Cabaret is a 2 h walk from our village, so it is not that far. And from Cabaret we take a ride by car or bus to get to Port-au-Prince, it takes about another 45 min. (Interview 7, Casal)

These findings suggest that the combination of environmental factors, and social and economic factors, all of which are beyond the control of individuals, influences the life chances of rural Haitians and therefore drives internal migration patterns in Haiti—much as they do in the neighbouring Dominican Republic (Alscher 2011).

7.3.3 Urban Environmental Decline

Interview and focus group participants described the severe environmental problems that exist in Haiti's urban areas, such as overcrowding, air pollution, and flooding. The absence of any semblance of urban planning exacerbates the pressures of rapid population growth, especially in Port-au-Prince, Haiti's capital and largest urban centre. According to participants, the lack of planning and municipal infrastructure means slums have grown in an uncontrolled fashion, engendering widespread environmental problems. These include lack of sanitation (which facilitates the spread of disease) and a lack of basic necessities (food, clean water, basic health care services, etc.) across urban centres. Participants said:

> I left Haiti [Port-au-Prince] because there were a lot of beggars in the streets, also most of the trees have been cut. There is a lot of dust in the air because the roads aren't paved. I cannot even speak of any environment in Haiti [because it is so bad]. (Quote from focus group 3)
>
> Due to the fact that there has been so much deforestation, as a result cities get flooded; and since cities are flooded, this causes a lot of problems for the [urban] population. It is a common situation [the flooding]. (Quote from focus group 2)

Participants highlighted the severe vulnerability of slum residents due to where slums are situated—often in areas prone to floods and landslides. Not surprisingly, tropical storms lead to unnecessarily high losses of life and property in slums, additionally stressing already scarce basic necessities in the cities.

7.3.4 Social Inequality

Participants recognized the implicit manner in which social inequality is both a cause and an outcome of the environmental problems in cities. The poor and marginalized suffer most from lack of sanitation, unsafe housing, and food and water insecurity, but are unable to migrate away from them. This situation is exacerbated as ever more rural residents move into urban slums seeking better life chances. However, not all those who might wish to leave the countryside are able to migrate into the city because it requires resources to do so. As one interviewee explained:

> It is not the poor [rural] people who migrate [to cities], but rather people who have resources. Like people from my village, those who have the financial resources left everything behind to go to the city and stayed there. Whereas there are people who come from even more distant rural areas, where living conditions are even worse than in my village, they come to us [i.e., they migrate to my village]. Whereas I left my village to go to the city [Port-au-Prince]. Like sometimes we think our conditions are not good, and there are others that have it worse than us. It is like a chain. (Interview 1, La Chapelle)

Urban elites—those with transferable skills and higher education—are not as directly affected by the severe urban environmental problems as are the poor. But the continuous decline in urban ecological conditions is linked to other social issues, such as a pervasive sense of insecurity. These social factors become a catalyst for the elite population to migrate away from Haiti to the U.S., the Dominican Republic, or Canada. Although the ultimate decision to migrate and the international destination chosen are typically based on social, political, and/or economic considerations, Haiti's acute urban ecological decline makes migration abroad increasingly attractive to those who have the means. Our participants explained:

> In Haiti there are different social classes. There are wealthy people, but because of the pollution, we have polluted air in Haiti. Some leave Haiti because of this problem [pollution], because [pollution] also affects the sanitary systems. […] Some families have left Haiti from the most remote areas. It happens in stages. People first leave the rural areas to go to the city [Port-au-Prince] and when they have the resources to leave Haiti, they leave to go to other countries, generally to the USA. […] In addition to the problem of air pollution, there is also pollution of the very water we are drinking. The water [in Haiti] is not safe. We can have money and everything else, but even drinking water is polluted. That affects our health. (Quote from focus group 4)
>
> The majority of people who leave Haiti is because of the political [instability] because some people [the well-off] can live well there [in Haiti], but because of the political [situation] they cannot go out [of their house]. Even if you have money, sometimes it is not safe. It is the political situation [in Haiti]. If it weren't for the political situation, no one would be looking to come [to Canada]. Even just to bring the kids to school, we don't know what could happen even in your own car, someone could attack you. (Quote from focus group 4)

7.4 Interconnectivity of Factors

Participants in the study emphasized the complex nature of the intersection between environmental, political, and socio-economic factors in their home country. This situation has created a vicious cycle at the centre of which is deforestation, which is in turn simultaneously a symptom and a cause of socio-economic, political, and environmental problems (see Fig. 7.1). Participants debated the extent to which political instability and corruption of government officials drive this cycle compared with the general economic malaise, especially in rural areas.

Analysis of participants' statements reveals a general consensus that the poor environmental conditions in Haiti's rural areas and the lack of a well-functioning governance structure are intertwined. We recorded 22 separate instances where participants made links between the causes of deforestation in their rural hometowns and the absence of any responsive actions on the part of the Haitian state in rural areas. The general sense was that the Haitian state has largely abandoned rural populations to their fate. This is illustrated in the following quote:

> If a true state existed in Haiti, the environment in rural areas wouldn't be as [degraded as] it is today. But because there is no state, especially in remote areas, people do what they can to survive, including excessive cutting of trees. (Interview 2, Fort-Liberté)

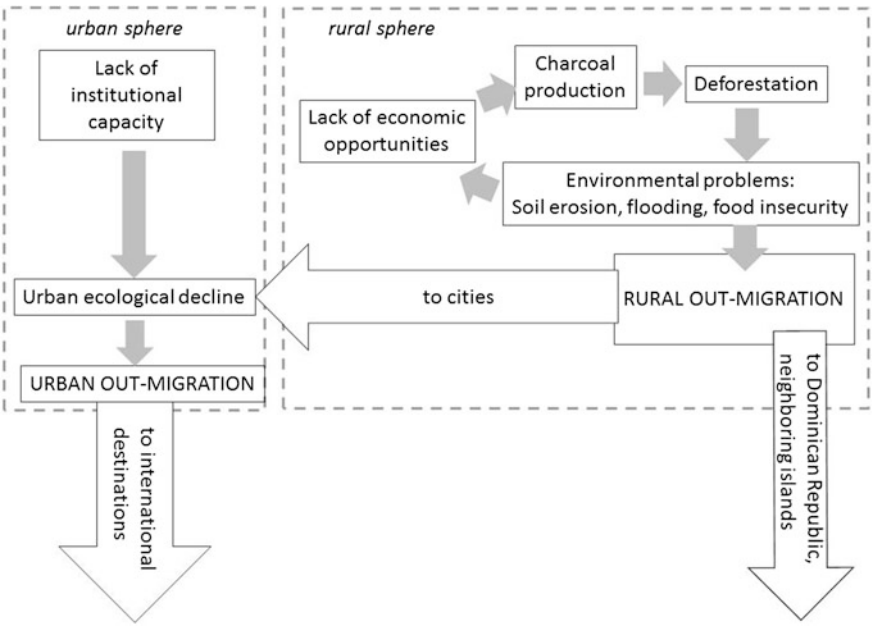

Fig. 7.1 Generalized role of the environment in Haitian migration processes

7.5 Immigration Strategies

Participants agreed that the extent to which particular factors had a direct or indirect influence on migration decisions and destinations depended on an individual's social status and place of origin in Haiti. People from rural areas who migrate internationally tend to travel to other destinations within the Caribbean (the Dominican Republic or neighboring islands) or to Florida. Urbanites, however, tend to migrate from Haiti to urban centres in the U.S., France, or Canada. For immigration to Canada, focus group participants stated that an advanced level of education was their most valuable asset to make immigration possible. Education is the gateway to a good professional position in Haiti, which in turn enables two things: (1) it makes it possible for the would-be migrant to qualify for a permanent-resident visa under Canadian immigration policy, and (2) it provides them with sufficient income to cover the costs of immigration—application fees, legal fees, and travel and relocation costs. This reinforces the existing socio-economic stratification and inequalities in Haiti, by creating a group of relatively privileged people who have the opportunity to migrate to a destination like Canada.

Participants also discussed at length the significant role social networks in Canada and other destination countries played in their migration decision and strategies. Relatives and acquaintances often assist immigration applicants with the lengthy migration process. They do so by providing guidance on how to file complex immigration forms, referring would-be migrants to trustworthy migration facilitators in Haiti, lending money, and sharing useful tips to pass the interview with a Canadian immigration officer in Haiti.

For those who are not educated urbanites with reasonable prospects of immigrating directly to Canada, international migration is a much more complicated process. As described by the participants, the migration strategies of rural Haitians who migrate internationally unfold in stages. The first stage is the journey to a city (usually Port-au-Prince) to study and/or find a job. Once there, rural migrants often experience difficult economic, political, social, and environmental conditions, prompting many to migrate onward to a nearby international destination such as the Dominican Republic, Cuba, or the Turks and Caicos. Others try a different route, such as migrating illegally to the United States or Mexico by sea, although this option is dangerous and expensive. Participants described this phenomenon as follows:

> Haitians migrate to the U.S. by boat from Cap Haitien. People of Fort-Liberté find someone who has a boat (at Cap Haitien) and offer him a large sum of money. Later that person goes back to Fort-Liberté and waits for a call from the *dealer* to tell him the date of departure. The journey by boat from Cap Haitien to Florida takes about a day. (Interview 2, Fort-Liberté)
>
> Once close to the U.S. or Mexican shore, the passengers are released into the sea… causing the death of many people because they are not used to swimming long distances after a journey of several hours. (Interview 3, Cayes)

7.6 Discussion

The findings from our focus groups and the interviews are consistent in three ways with the findings of empirical studies on international environmental migration done elsewhere:

1. Rural populations are generally more vulnerable and more directly affected by broad environmental changes than are urban residents (Gila et al. 2011; Bogardi and Warner 2008).
2. Rural populations are more likely to migrate intra-nationally and/or intra-regionally (e.g., Gray 2009).
3. Environmental factors play an indirect role in the migration decisions of urbanites, who are more likely to migrate internationally (Wrathall 2012; Gray 2009; Findley 1994).

It is worth noting that participants had directly observed (and in some cases experienced firsthand) these difficult environmental conditions, their impacts on the means of subsistence of rural Haitians, and how it affected rural-to-urban migration within the country. It was not hearsay they were reporting. Much of the rural-to-urban migration taking place in Haiti and from rural areas to other destinations within the Caribbean region is consistent with the term *environmental migration* as it is used in the literature, given how significant a stimulating role deforestation plays. While rural populations experience the environmental consequences of deforestation most directly, there are clear repercussions for urban populations. As slum populations grow, so do food, water, and health insecurity.

By comparison, Haitian migration to Ottawa-Gatineau and Montreal does not fit the generally accepted description of *environmental migration*. Participants in our study mobilized their employment skills, education, and social networks to migrate to Canada. They did so primarily for reasons traditionally viewed as the most common for migrating internationally: economic advancement, family reunification, and/or a desire to live in a more socio-politically stable location. However, the phenomenon of migration says something about the places left behind as much as it does about the places to which people move. In this example, the life chances and quality of life for urban elites in Haiti are adversely affected by declining urban ecological conditions, which are only made worse by the influx of people from an increasingly degraded rural environment. Given the interconnectivity of these issues, it is not possible to disassociate one phenomenon (international migration to Canada) from the other (endemic environmental degradation in Haiti). The environmental influence on international migration is indirect and subtle, but it is indeed present.

The implications, however, of social inequality in Haiti are plainly evident. Environmental degradation exacerbates poverty and social inequality in rural Haiti. This forces many to seek opportunities in urban centres, where they typically live in

slums located in areas highly exposed to environmental risks. The growing slum population creates new challenges in terms of food and water insecurity, and public health. While the poor find themselves trapped in locations and conditions of growing environmental and economic insecurity, Haiti's urban elites have the option of migrating to Canada, where immigration regulations encourage the arrival of skilled, educated, working-age adults, especially those with strong French or English language skills. This option is simply not available to the majority of Haitians. Our research project was, by design, focused on understanding Haitian-Canadian migration from the Canadian end of that network. We are therefore not able to document or comment on how the out-migration of urban elites to Canada affects the dynamics of social (in)equality in the places they left behind. However on first principles, it is difficult to envisage how social equality in Haiti would be enhanced by having such talented people leave the country. Our participants emphasized how lack of planning and inadequate government services and programs contribute to the entrenched environmental and socio-economic problems in Haiti. Planning and programming requires human capital to function effectively, some of which is clearly leaking out to Canada and other developed nations. We recognize we are raising the question of how *brain drain* affects social inequality and economic development in migrant-sending areas—a subject much discussed in migration literature over the years and one where Haiti is often identified as a net loser of skilled human capital (Beine et al. 2008). We cannot answer this question, but raise it as an opportunity for further research. Concomitantly, outmigration of human capital (*brain drain*) could be contributing to greater social inequality vis-à-vis environmental degradation in Haiti.

In future research, it would be worthwhile replicating our methods in Port-au-Prince and other urban centres. We would thus be able to assess whether our findings in Canada are similar in terms of how environmental factors are perceived by Haitian urban elites and who may be contemplating international migration. It may be that our participants, who are now well established in Canada and can reflect on their experience, have different recollections of the strength of the influence of environmental degradation, food and water insecurity, and similar factors on their decisions to migrate, compared to people who are still actively experiencing such factors. We deliberately sought to control for the 2010 earthquake because our particular interest was in non-geotechnical environmental challenges. We also wanted to compare findings from this study with findings from concurrent projects with other immigrant communities in Canada. Research done in Haiti today would not be able to control for this, and so by definition, the environmental influences on international migration today would include the aftermath of the earthquake. In future research in Canada, we may pursue a similar methodology with Haitian immigrants who have arrived since 2010. This would provide an opportunity for interesting before-after comparisons.

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Chapter 8
Social Inequality and International Migration Related to Climate Stressors: The Case of Mexico

Kerstin Schmidt

Abstract Moving away from considering climate change as a direct or indirect push factor of migration, this chapter focuses on the unequal access of people affected by climate-related stressors to existing migration networks. Underprivileged members of society often lack access to these networks and are therefore unable to migrate internationally because they cannot reduce the costs and risks of potential migration projects to an acceptable level. Climate change might aggravate this situation by having an adverse impact on people's socio-economic condition. This in turn increases the pressure to adapt in situ or migrate and adds to existing social inequalities. Based on empirical data from the Mexican states of Zacatecas and Veracruz, this chapter describes how access to migration networks depends not only on economic resources but also on the cultural context, individual preferences, and personal attributes, such as age and gender. Thus, people who might not be able to migrate now will be even less able to do so under more severe socio-economic conditions brought about by climate change, as they do not have access to existing migrant networks. On the other hand, some people never sought access to migration networks because they never wanted to leave their communities, and this view doesn't change in the context of climate change stressors.

Keywords Mexican migration · Climate migration · Social inequality · Migrant networks · Interstate migration · Veracruz · Zacatecas

8.1 Introduction

This chapter examines the potential relationship between climate change, international migration, and social inequality in sending regions of international migrants. This relationship is addressed using the example of Mexico-U.S. migration, based

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on empirical data from the two Mexican states of Zacatecas and Veracruz. Fieldwork was conducted in 2008 and 2009 as part of the Ph.D. dissertation project of the author that investigated the potential nexus between climate change and migration in Mexico.[1] Empirical results from this study suggest that, while future climate change is not likely to increase the number of international migrants,[2] it can be expected to directly and indirectly have an impact on people's socio-economic conditions (Schmidt-Verkerk 2012). Direct and local climate change impacts are most evident in the effect of changes to precipitation and temperature patterns which adversely affect agricultural productivity. Indirectly and at the global level, climate change also affects global food systems and consequently prices for basic consumer goods (Conde et al. 2007). As a result of both direct and indirect impacts of climate change, the socio-economic conditions of many village dwellers, particularly poor people in rural areas of developing countries including Mexico, can be expected to worsen (Yamin et al. 2005).

People in need tend to respond to changing climatic conditions with a variety of *in situ* adaptation strategies and to explore the option of leaving areas where they are unable to maintain themselves and their families. At the same time, as this chapter will illustrate with the case of rural Mexico, international outmigration is not a feasible response strategy for many to the predicted and current effects of climate change. Under the same unfavourable structural conditions, some people migrate internationally while others do not. For marginalised segments of the population, access to international migration might even become further restricted. Understanding the selection criteria for access to international migration and the potential impacts of deteriorating socio-economic conditions on the selective nature of international migration will contribute to a nuanced awareness of the potential impact of climate change on migration patterns in rural Mexico. These selection criteria will be analysed through the lens of social inequalities within the researched rural communities in Zacatecas and Veracruz.

Based on these considerations, the following theoretical reflections and the empirical analysis are guided by the question how and to what extent climate change has the potential to increase social inequalities by worsening socio-economic conditions in migrant-sending regions. Also considered in this chapter will be the consequences that can be expected for people's access (or lack thereof) to international migration as a response strategy.

The second section of this chapter links the concepts of climate change, migration, and social inequality to provide the framework for an empirical analysis. Section three then gives a brief overview of the heterogeneous nature of the existing migration patterns in the two Mexican states Zacatecas and Veracruz—each with distinct migration histories. The fourth part of this chapter considers who migrates

[1]Refer to Schmidt-Verkerk (2012) for a detailed account of the methodological approach and a complete description of the socio-economic and environmental conditions in the research settings.

[2]While internal migration also plays an important role for many people in Zacatecas and Veracruz, a detailed analysis of the impacts of internal migration on social inequalities goes beyond the scope of this paper and will therefore not be discussed here.

and who does not based on the selection criteria: 'access to financial resources', 'economic benefit of migration', 'willingness to migrate' which includes the approval of others, and 'perceived ability to migrate'. These analytical categories are based on fieldwork data derived mainly from qualitative interviews with family members of migrants and returned migrants, in the two regions. The final section summarises the results and identifies factors that seem to influence the effects of migration in the context of climate change on social inequalities for the case of Mexico.

8.2 Linking Climate Change, Migration, and Social Inequality

The nexus between climate change and migration has been addressed in various ways. Some studies conceptualise it as a linear relationship, while others acknowledge the complexity of both migration decisions and responsive strategies to worsening socio-economic conditions in the context of climate change (Jónsson 2010). The latter perspective is more complex, as it conceptualises climate change as one driver of migration among others and migration as one course of action within a range of potential responses to climate-related stressors. However, both perspectives seek to evaluate the role of climate change as a direct or indirect push factor of international migration.

Another way of approaching the climate change-migration nexus is by conceptualising climate change as an overarching external stressor which aggravates existing socio-economic conditions. In this way, the impact of drivers of migration on people's livelihoods has the potential to become enhanced under adverse climatic conditions (Black et al. 2011). Yet, while socio-economic conditions might worsen as a consequence of climate change, not all members of affected societies will respond by migrating internationally. The importance of migrant networks in facilitating migration processes has been stressed, particularly in theories on the cumulative causation of migration. These theories argue that additional migration becomes more likely in societies in which migration networks exist between family members and friends who have already migrated, and with related non-migrants. Access to migrant networks has the advantage of reducing both the costs and risks of migration for potential future migrants (Massey et al. 1993). Yet, in most migration contexts, not all members of a society have access to migration networks and to the social and economic capital required for international migration. Therefore, those who do not have access to migration networks—and thus to the benefit of reduced costs and risks related to their migration projects—are likely to find it more difficult to use migration as an income generating strategy.

Bringing climate change back into the discussion, this means that under more severe socio-economic conditions, *inter alia* caused by climate-related stressors, a larger number of people may opt for international migration as a response.

International migration can be explored in different ways; by establishing new migrant links or—which is more likely—by using existing migrant networks (Aksakal and Schmidt 2015). On the other hand, those who do not have access to established migrant networks might find it even more difficult to use international migration as an adaptive strategy to the consequences of climate change.

The concept of social inequality is a useful analytical device to demonstrate how climate change might broaden the socio-economic gap between members of a society who can access international migration networks and those who cannot make use of this adaptation strategy. According to Hradil, "…social inequality exists when people frequently receive more of a society's 'valuable goods' than others owing to their position in the social network of relationships" (2001: 29). While patterns of social inequality have always existed within most societies, these patterns might change for the worse, both under conditions of climate change, which is expected to often have the most severe impacts on the weakest members of society (Yamin et al. 2005), and in the context of unequal access to migration networks (Faist 2014).

The effects of social inequality on migration decisions and the effects of migration on existing structures of inequality have been studied extensively, mainly with regard to economic inequality based on the sending of remittances (Bastia 2007). Since the 1980s, it has been acknowledged that remittances have the potential to increase social inequalities (Lipton 1980). This is because those who migrate across borders are generally not the poorest of the poor but instead belong to the middle to upper economic segment of the population. Remittances sent by international migrants to families who belong to these population segments are expected to lead to an increase in the economic potential of those who are already relatively better-off and to a relative deprivation of those who cannot afford to migrate (Bastia 2007; De Haas 2010; Black et al. 2006).

A second way that social inequality is linked to migration—and to which the analysis of the empirical data in this chapter relates—is the selective access to international migration networks and related benefits of migration. It has been argued that economically underprivileged society members are in many cases excluded from access to international migration opportunities (De Haan 1999). Nevertheless, the number of people who benefit from international migration and respective remittances within a society might change as migration patterns develop over time. Stronger migration networks have the potential to also involve poorer members of society and thus reduce social inequalities related to the access to migration in the long run (Mckenzie and Rapoport 2007). However, also in the context of climate change, for some people migration might be economically beneficial, while for others it remains an inaccessible way of income generation and therefore does not represent a feasible adaptation strategy.

These theoretical reflections about the linkage between climate change, migration, and social inequality will in the following sections be illustrated with examples from Mexico. Most research on climate change-migration linkages in Mexico suggest that Mexico-U.S. migration is likely to increase under conditions of

decreased agricultural yield caused by future climate change (Deheza and Mora 2013; Nawrotzki et al. 2013; Sánchez Cohen et al. 2012; Colunga and Rivera 2011; Hunter et al. 2011; Feng et al. 2010; Munshi 2003). Yet, these studies generate a very broad and general perspective on climate stressors as a push factor for international migration and therefore cannot provide detailed information on the potentially different effects of climate-related stressors on distinct groups of people in different regions of Mexico.

In contrast, the following empirical analysis is based on the assumption that access to migration networks and the option to make use of migration as a livelihood strategy also represents an advantage in the context of climate change. Those who can access international migration networks, either by receiving remittances or by leaving areas of unfavourable socio-economic and environmental conditions, have got another response option in addition to a variety of *in situ* adaptation strategies, which they might make use of or not. The empirical analysis starts with an overview of different migration patterns in Zacatecas and Veracruz before addressing the factors that enable access to migration networks.

8.3 Migration Patterns in Zacatecas and Veracruz

Zacatecas is a classic example of a Mexican state dominated by migration that historically developed and gained importance over the course of the last century. The first migrants were contracted by the U.S. to build railways and to work in agriculture and mining. During the Bracero Program (1942–1964), more than 4.5 million Mexicans worked in the U.S., most of them from the four states of Jalisco, Michoacán, Guanajuato and Zacatecas (Massey et al. 1987). At present, Zacatecas is still one of the most important international migrant-sending states in Mexico. However, the state is not homogenous with respect to the intensity of international migration. In general, migration to the U.S. is more frequent in the wealthier south than in the poorer north of the state (Delgado Wise et al. 2004). In El Tigre the village in the southern part of Zacatecas, where fieldwork was conducted, the rate of illegal international emigration is very high.[3] The majority of these migrants go to Chicago where a large migrant community is established. Some families also have access to migrant networks in California. Although recruiters from the U.S. and Canada seek legal migrant workers, the majority of migrants prefer to migrate illegally. Interviewees said they can earn more money as an undocumented migrant than as a legal migrant. Furthermore, the work contracts of most legal migrants are limited to a few months, which does not yield enough money to cover their costs.

[3]Empirical research in the context of the Ph.D. project included fieldwork in a village in the northern part of Zacatecas. As international migration only plays a minor role in this village, it has not been included in the analysis presented in this chapter.

Unlike Zacatecas, Veracruz has a very short history of labour recruitment by U.S.-American companies. International migration started as recently as the 1990s. As a consequence, there are no long-established migration networks on which residents can rely. Nevertheless, both illegal and legal international migration is a common phenomenon in many parts of Veracruz. Because of the lack of long and shared migration histories in the village communities, destinations of migrants from Veracruz vary. This is contrary to Zacatecas where the majority of migrants from a village move to the same destination in the U.S.

Empirical data from Veracruz was generated in two village communities, Cascajal del Río and Nuevo Renacimiento. The most important difference between the two villages is that Nuevo Renacimiento is a resettled community established in 2000 after a major flood of the Tecolutla River had destroyed the houses of the current village dwellers. As a consequence of the resettlement, many people no longer own farmland or their farmland is relatively far away from their homes. In Cascajal del Río, by contrast, many people own farmland and/or cattle. Despite these different historical and socio-economic circumstances, migration patterns in the two research settings in Veracruz are similar. However, illegal migration to the U.S. from El Tigre on the one hand, and from Cascajal del Río and Nuevo Renacimiento on the other, shows two major differences. First, the majority of people from El Tigre move to Chicago, whereas migrants from the two communities in Veracruz do not have any particular destination. Second, using the example of the state of Sonora, Castro Luque et al. (2006) distinguished between migrants from other states who arrive with the intention of crossing the border immediately from those who intend to stay in the border region first. Migrants from El Tigre often belong to the first category, while migrants from Veracruz can be found in both categories. Furthermore, in Veracruz the choice of destination of migrants does not—as in Zacatecas—depend to a large extent on the migration history of the village but rather on personal contacts and financial resources.

8.4 Selection Criteria for International Migration and the Role of Climate-Related Stressors

Migration in Mexico, as elsewhere (Cattaneo 2007), is a highly selective process. Differences between regional patterns of migration, as seen in the distinct structures of international migration in Zacatecas and Veracruz, show that the migration history and the related access to migration networks play an important role. In regions where international migration has evolved over generations (e.g., Zacatecas), migration networks are often stronger and more developed at the community level than in regions with a shorter migration history (e.g., Veracruz).

Yet, these historically evolved migrant networks do not fully explain why some members of a community migrate and others do not. Under the same structural conditions and affected by the same socio-economic stressors—lack of sufficient

employment opportunities, low wages, decreasing farm productivity, and decreasing purchasing power due to gaps between income and costs for basic consumer goods—some community members respond by migrating internationally while others choose alternative livelihood strategies or combine different *in situ* or mobile response strategies. Alternative strategies might include the establishment of small businesses, obtaining credit, selling land or livestock, or internal and circular forms of migration (Schmidt-Verkerk 2012).

While these livelihood stressors and potential response strategies have existed in many parts of rural Mexico for generations, climate change—in combination with other economic and societal stressors—has aggravated the living conditions over the past years and is likely to continue to do so in the future. As mentioned, climate change can be expected to have socio-economic impacts at the local level as well as the global level. Fieldwork showed that climatic stressors at the local level, in the form of changing precipitation and temperature patterns, have had a severe impact on farming. For example in Zacatecas, rainfall patterns have shifted in such a way that regular annual farming cycles cannot be assured anymore because the rainy season starts later than in the past. The delayed rainfall has meant that fields are not arable in time for sowing, and the annual agricultural cycle becomes too short for a harvest before the cold period starts (Schmidt-Verkerk 2010). The deteriorating agricultural conditions have an impact on the productivity of subsistence agriculture as well as on commercial farming, which in turn affects the availability of jobs for many rural dwellers.

In both Zacatecas and Veracruz, the global effect of climate change on people's livelihoods is manifested through increasing prices for basic consumer goods and a related decrease in people's purchasing power. In combination with low salaries and decreasing job opportunities, for instance in commercial farming, livelihood stressors increase, which might create more incentives for international outmigration. However, decreasing purchasing power and unemployment are also likely to render many families and communities poorer, making access to financial resources needed for international migration more difficult. On the other hand, rising food prices may also increase the profitability of agricultural production thereby providing an incentive for farmers to stay. The availability of employment at migrants' destinations might also be affected by climate change—directly in commercial farming and indirectly through a weak economy. Thus it seems that the net effect of climate change on illegal international migration is probably not great because some of the effects neutralize others. As a consequence, it is likely that access to international migration will become even more selective than it has been in the past.

Empirical results in Zacatecas and Veracruz suggest that the answer to the question if the above-mentioned livelihood stressors translate into international migration, are addressed by other livelihood strategies, or by a mix of *in situ* strategies and migration, depends on a variety of factors. The most important factors on which decisions for or against international migration depend can be summarised in the analytical categories: access to financial resources, economic benefit of migration, willingness to migrate, and perceived ability to migrate. Most of these factors, apart from the economic resources of a household and the related perceived

economic benefit of migration, are not susceptible to climate change impacts. They are, nevertheless, important criteria that determine who migrates and who does not. To provide insight into this selective process, these interlinked and overlapping factors will be discussed in the following sections. One thing is evident, while poverty is a factor that contributes to the lack of access to international migration and to migration networks, personal motivation and views can also enhance or hinder the access to international migrant networks.

8.4.1 Financial Resources

International migration is expensive. For illegal international migration, in addition to transportation costs to the destination area, there are the costs associated with crossing the border. Depending on the services offered and the destination in the U. S., the 'coyote' or smuggler charges 2000–4000 USD for the border crossing per undocumented migrant. Sometimes this amount, or part of it, can be paid off with the migrant's first salaries in the U.S. This carries the risk of not being able to repay the debt if the migrant does not find employment or is apprehended by the police or border patrol. Although economic reasons are an important driver of migration, only those who have the necessary resources or have access to formal or informal credit are able to finance international migration projects. According to people in the case study who had crossed the border illegally several times, the risk of being apprehended has recently increased due to stricter border control measures. Data from the Mexican Migration Project (MMP)[4] support the empirical observation that prices for illegal border crossings between Mexico and the U.S. have steadily increased since the 1980s.

With regard to the three central concepts of this chapter, this means that climate change had an aggravating impact on the socio-economic conditions in the researched communities, which may represent an additional push factor for international migration. Those community members, who possess social capital and have access to social networks, can reduce the costs and risks of migration and are therefore in an advantageous position. Community members who do not have these resources at their disposal are excluded from these benefits. Accordingly, in the context of increasing socio-economic pressure propelled by climate change, certain segments of society are excluded from migration opportunities due to their lack of social capital and due to the absence of social network connections. In turn, this is likely to increase social inequalities in Zacatecas and Veracruz.

Next to historically developed differences related to the form and strength of migrant networks at the community level, and the absence of households' economic resources, motivational and socio-cultural reasons as well as personal attributes help

[4] http://mmp.opr.princeton.edu/results/009firsttrip-en.aspx.

explain why some people do not have access to—or consciously avoid connecting to—migrant networks. These factors, which are likely to increase social inequalities, are presented in the following sections.

8.4.2 Economic Benefits of Migration

Apart from the fact that many families cannot afford to migrate or cannot choose a certain form of migration due to financial constraints, some people do not want to spend their money on migration. Some interviewees argued that the labour market in the U.S. has softened and it has become increasingly difficult to find employment that justifies the high cost of the trip. An important reason for the decrease in job availability at migrant destinations has been the economic and financial downturn, which started at the end of the 2000s. This has precipitated an increase in return migration that was noted in Veracruz where fewer migrants possess well-established links to U.S. employers. However, this was not the case for migrants from Zacatecas. Employers usually prefer migrant workers they know from previous U.S. trips over newcomers. Thus the perception of the benefit of migration, especially with a precarious economic situation in the destination area, seems to depend on the degree to which the prospective migrants know (or think they know) what to expect of the labour market.

8.4.3 Willingness to Migrate and Approval of Others

Fieldwork showed that, in most cases, the expected benefit of migration over staying in the home community was financial. However, some people in the researched communities did not consider migration as beneficial. Many of them thought that the social cost of leaving their family and friends outweighed the financial gains they might expect. For some, the emotional bonds with their home community were so important that they did not want to leave. Others were unwilling to migrate because of the responsibility they felt for family members. Yet, social pressure to take care of family members also affected decisions to migrate. Literature on the significance of Mexican migration argues that, in some communities, young people are socially forced to migrate because migration is viewed as a rite of passage that should be embraced so they can earn money away from home for the family (Moctezuma Longoria 2005; Kandel and Massey 2002). However, fieldwork showed that in some cases people could also be socially forced to stay. The disapproval of migration by family members discouraged some potential migrants from leaving the village. This was especially true for women with small children, who are expected to take care of their children, their parents, and their parents-in-law and, therefore, often cannot migrate. In Zacatecas, the international migration of women is often socially unacceptable except when their husband or

father has arranged for the (in those cases often legal) border crossing. In Veracruz, by contrast, young single women as well as men often leave the village to move to the border region and cross the border after they finish school.

Some people reported that they did not want to migrate because they felt attached to their life in the village, their house, their cattle, their land, or other belongings. The reluctance to leave was also caused by fear of the dangers of migration. Some, who had been away from their community and returned, resisted the idea of migrating again. Sometimes this was due to fear or the memory of a bad experience; sometimes it was caused by an unwillingness to leave a familiar environment.

8.4.4 Perceived Ability to Migrate

Migration is expensive, potentially dangerous, and an endeavour that requires a certain degree of physical and mental fitness. For these reasons, some people do not consider themselves, or are not considered by others, to be suitable to migrate. Age and gender are the most important factors that limit people's (perceived) ability to migrate. People over the age of 50, or sometimes younger, often do not think they will be able to successfully complete the journey and find employment in the destination area. Therefore, they often do not think that migration is a suitable livelihood strategy for them.

Education and the perceived level of personal independence are other aspects limiting people's motivation to migrate internationally. Particularly those who have never migrated and have no family links to international migrants seem to doubt they would be successful international migrants themselves. They may fear that their qualifications are insufficient for the international labour market or that they might not be able to cope with everyday demands at the personal level due to the lack of language skills, the inability to adapt to a new environment, etc.

8.5 Conclusion

This chapter began by conceptualising climate change as an additional external stressor that has the potential to adversely affect the socio-economic situation of people—particularly poor people in developing countries. It suggested analysing the nexus between climate change and migration through the lens of social inequality by focussing on social inequalities in relation to unequal access to migrant networks. Strong migrant networks facilitate access to migration by reducing the costs and risks involved, particularly for international migration projects.

Empirical evidence from Zacatecas and Veracruz, two Mexican states with very distinct histories of international migration and resulting different migration patterns, showed that financial assets are an important precondition for access to

migrant networks. In addition, motivational and socio-cultural reasons, including the willingness to migrate and the approval of others, the perceived benefit of migration over staying put, and the perceived ability to successfully migrate, strongly influence people's decisions whether or not to access migrant networks at the community level. These reasons are strongly linked to personal attributes, such as gender and age, as women and elderly people seldom migrate (anymore).

Climate change is unlikely to increase the number of international migrants in Zacatecas and Veracruz despite the negative effects of climate change on people's livelihoods. Yet, international migration might become more selective and existing migration patterns might change. Therefore, an adequate way of addressing this linkage is to analyse the existing migration links and related networks. Not all members of society have access to migration networks. This can be involuntary, due to a lack of economic and social capital and in response to social pressure not to migrate. Or it can be voluntary, because people prefer to remain where they are. A further question arising from these insights is if, and potentially how, the consequential effects of climate change differ for people who voluntarily or involuntarily do not have access to migrant networks.

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Part III
Methodological Reflections

Chapter 9
Hidden in Plain Sight: Social Inequalities in the Context of Environmental Change

Brooke A. Ackerly

Abstract This chapter demonstrates the need to study social inequalities in relation to environmental stresses and change, using methods that bring our attention to injustices that are hidden in plain sight due to social, economic, and political dynamics. Using recent research by a collaboration of physical and social scientists, engineers and ethicists about the human-environment interactions in southwestern Bangladesh, I show that familiarity, frequency, and fragmentation can obscure injustices related to environmental and social change, even from those interested in broad patterns of injustice related to climate change. The methodological commitments, which need to be part of a global, connected research agenda to address environmentally exacerbated social inequalities, are interdisciplinarity, integrated local and global scales, and intersectionality.

Keywords Social justice · Methodology · Gender · Bangladesh

9.1 Introduction

True *natural* disasters are rare. What is often referred to as a natural disaster is an environmental event that has had a significant impact on people. How disastrous it is and for whom are matters of engineering, political, economic, and social conditions' dynamics and relations *prior* to (and after) such events. While an environmental

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event is not socially constructed, its impacts are. This is certainly true if these events are caused by anthropogenic climate change. It is also true if these events cannot be tied to climate change. If there are patterns to the harmful impacts of environmental events, we should not only describe these impacts, but also consider what they tell us about social inequalities past and future. The harm caused by environmental disasters is not randomly distributed because environmental vulnerability is not evenly distributed. Environmental vulnerability flows from the dynamics and relationships of power. Therefore, it is not only the anthropogenic historical causes of environmental change but also the political, economic, and social dynamics and relations that create particular conditions of vulnerability that are issues of social inequality. This chapter diagnoses why the social inequalities related to the environment are often invisible to all but those who struggle against them. I will also outline three methodological commitments that, if adopted, would improve social scientific and normative research into environmental and social inequalities. These are *meta-methodological* commitments because they can be used across a broad range of research methods and disciplines.

In the first part of the chapter, I argue that there are three classic ways in which social inequalities are invisible within societies and to those who study them. Through familiarity, frequency, and fragmentation, social inequalities are invisible, acceptable, or hard to count. In the second part of the chapter, I offer foundational meta-methodologies that together can help the burgeoning fields of migration, environmental change, and social inequality studies focus on the issues of social inequality. These include analyses (1) informed by interdisciplinary research, (2) informed by global and local levels of systems and impacts, and (3) that pay attention to the ways that subgroups within a population may be affected by a phenomenon even if the broader demographics are not.

For those familiar with and attending to these issues, this chapter offers a theoretical argument to support efforts to build and fund the kinds of collaboration necessary to do this work. For those who are unfamiliar with these issues, this chapter may be challenging. In general, arguments about social inequality have to do two things: they have to convince the audience of the veracity of what is described, *and* they have to convince the audience that the problem is worthy of their attention. I will only focus on the first of these. Feminist scholarship on revealing injustices that have been part of daily life and assumptions of many has shown that we need to make such issues visible through case studies, even when the point is broader than that. Therefore, in this chapter, I draw for illustrative purposes on insights from a study in progress.

Only some of the elements of environmental change relevant to social inequality can be understood in the context of global forces such as climate change and ecosystem degradation (Warner et al. 2009). Most have significant local factors that have to do with physical, social, economic, and political dynamics. I contextualize my theoretical and methodological arguments in an interdisciplinary study of

environmental and social change in southwestern Bangladesh,[1] because Bangladesh is often viewed as being on the front line of climate change and poverty—a notion that is actively advanced by the government of Bangladesh (Government of Bangladesh 2009).[2]

The large quantities of qualitative data we collected for this study are from 12 communities that were in the path of Cyclone Aila (May 2009). The storm affected the different communities in different ways in part because of the differences in their sources of livelihood, practices of accountable resource management, and (we found) community cohesion. The data included participatory rapid appraisal techniques, key informant interviews, and focus group discussions. We analyzed data from 343 transcribed translations using qualitative analysis software. This chapter does not detail the methods of the day-to-day research nor our findings. Instead, this chapter uses that research to illustrate the limitations in observation and analysis that need to be overcome in the study of complex dynamics, such as the impact of environmental change on people, *and* the meta-methodological practices that we can use to confront these limitations.

The illustrations in this chapter come from collaborative work in southwestern Bangladesh where two commonly cited environmental concerns affect the entire population: exposure to cyclones and lack of reliable sources of fresh drinking water. Our research reveals that rather than looking for broad patterns of vulnerability, we should be looking for broad patterns in our blindness to vulnerability. By oversimplifying the problems of environment and social inequalities to the broad strokes of climate change and global inequality as the global debate about climate justice has encouraged (Chakravarty et al. 2009; Farber 2007, 2008; Lohmann 2008; Pettit 2004; Posner and Sunstein 2007), we overlook key dimensions of injustice within the social, economic, and political, formal and informal, local and global institutions that govern affected populations (see also Schade 2013, and introduction and conclusion chapters, present volume). These processes are related to the same ones that allow racial injustices and gender injustices to persist. They

[1]This research is part of ISEE Bangladesh, http://www.vanderbilt.edu/ISEEBangladesh/about.php, a multi-disciplinary project, multi-university (Vanderbilt, Columbia, Dhaka, Khulna, and Jahangirnagar) project studying community and regional resilience to environmental change in coastal Bangladesh. The partnership is funded by the U.S. Office of Naval Research (Vanderbilt IRB approval 120454). The data and analysis from this research referenced in this chapter were collected from 2012 to 2013 using Qualitative Comparative Analysis of 12 communities in southwest Bangladesh, selected on the basis of variability in their vulnerability to sea level rise, cyclones, and inadequate fresh water throughout the year. The work includes the study of the sedimentology, hydrology, sociology, economics, and politics in a historical perspective. Additional data collection and analysis is ongoing. Persons whose efforts significantly contributed to the data in this chapter include Steve Goodbred (physical), Leslie Wallace (physical), John Ayers (physical), Jonathan Gilligan (physical and technical), 'Labib' Mujibul Anam (social), Sayed Muhammad Saikh Imtiaz (social), Bishawjit Mallick (social), and Anna Carella (social). Significant partnership with Kazi Matin Uddin Ahmed (geology, Dhaka University) informed site selection regarding salinity.

[2]It has also been on the frontline of adaptation (Ayers et al. 2014; Younus 2014).

are related to the same processes that render architectural norms such as steps up to a main entrance familiar, frequent, and *inconsiderate* of the impact of these norms on the accessibility of our built environments to people with certain physical disabilities. *Normalization*—the consequences of processes that conceal injustices in plain sight within our accepted values, practices and norms—contributes to the unexamined dynamics of environment and social inequalities.

Other chapters in this volume illustrate the greater understanding of inequalities that we can gain from studying cases. The purpose of this chapter is to argue at a more epistemological level why studies of environment and social inequality need meta-methodological resources for analyzing (1) their physical, engineered, and social dimensions, (2) their related local and global processes, and (3) the differential effects they have within and across communities. Methodological attention to epistemology, that is, to how we know, is necessary for challenging our epistemologies of justice and injustice (Medina 2012; Sullivan and Tuana 2007).

The first half of the chapter describes three ways in which inequalities related to environmental injustice may be invisible to many, even those interested in environmental insecurity and justice. In the second half of the chapter, I argue that, if we are to develop ethical, political, economic, and engineered solutions to the threats of climate change, we must understand the conditions, dynamics, and relations which affect how climatic events are experienced in vulnerable locations. I also articulate a general methodology for doing so. In sum, this chapter suggests that, in the study of environment and social inequality, we should be skeptical of assertions about broad patterns of vulnerability and injustice that are not informed by local physical, engineered and social processes, dynamics, and relations. We cannot generalize about the injustices that will be experienced as a result of climate change and other environmental problems. However, we *can* generalize about the value of certain meta-methodological approaches which will make sure that when we consider environmental change and its impact on people, we are attentive to the range of related injustices be they the result of pre-existing inequalities or emerging ones.

The normative import of confronting these epistemological challenges with appropriate methodologies is straight forward. The political, economic, and social hierarchies of a place have an impact on who is affected, how they are affected, and on the resilience of their communities to environmental conditions or disasters. To address these issues, we need to be aware of them. Regardless of the specific methods used to investigate a research question, our methods for studying injustice in the context of environmental change need to be contextualized within meta-methodologies of interdisciplinarity, levels of analysis, and intersectionality. First, let's see why these are necessary.

9.2 The Invisibility of the Injustice of Environmental and Social Inequalities: Familiar, Frequent, and Fragmented

Climate change is often framed as an issue of social inequality for women and people in poverty specifically. Some case-based analyses provide rich descriptions of the consequences of that inequality (Cannon 2002; Commonwealth Secretariat Social Transformation Programmes Division 2007; Dankelman 2002; Dankelman et al. 2008; Denton 2002; Roy and Venema 2002). Vulnerability is an important lens for thinking about gender justice, not only because the potential consequences of that vulnerability in the face of an environmental disaster are severe human-rights deprivations, but also because that vulnerability is evidence of pre-existing human-rights failings (Adger 2006; Bohle et al. 1994; Gallopín 2006; Intergovernmental Panel on Climate Change 2007; Janssen and Ostrom 2006; Mearns and Norton 2010; Vogel 2006). Environmental change is not a new terrain of inequality and injustice. Rather, it is a contemporary lens for re-examining the familiar terrains of inequality and injustice, including poverty and gender inequality and their historical legacies. If we focus on the outcomes of inequalities and harms, we will see patterns such as non-random mortality in natural disasters affecting poor women the most (Neumayer and Plümper 2007) but no path to change.

To address the patterns of social inequality that cause and are the consequences of environmental stresses, we need to look beyond platitudes and oversimplifications (McLeman 2014). Social, economic, and political conditions create a backdrop of inequality that render people differentially vulnerable. In addition, the subtle socialization processes that are part of this backdrop can conceal these consequences and the power dynamics that foster and maintain them in plain sight. That is the issue. The inequalities are concealed in plain sight and rendered normal or outside the range of inquiry. For feminist international-relations theory, rendering visible and adjudicating those *invisible* inequalities and injustices is a methodological imperative (Ackerly and True 2006, 2010; Enloe 2004). Recently, feminist philosophers interested in race issues have invited us to consider the ways in which the construction of knowing is political and a basis for injustice (Fricker 2007; Medina 2012). Science and technology studies help us consider the ways in which politics affects perception of facts (Harding 2008; Jasanoff 1991; Mayo and Hollander 1991). Another field of study demonstrates that social patterns of discrimination have their roots in individual bias that affects individual reasoning processes through automatic and implicit biases (Mo 2014). These fields all draw our attention to the conscious and subconscious politics of perception and knowing.

The purpose of this section is to demonstrate the things that get overlooked in the politics of perception and knowing. I argue that when harms and vulnerabilities are familiar, frequent or fragmented, their injustice is easily overlooked by those same processes of perception designed to notice patterns. I leave it to the literature described in the preceding paragraph to describe these cognitive processes. In this chapter, I focus on their consequences.

The chapter discusses three ways in which patterns of injustice and inequality curtail our abilities to see the injustice of these inequalities. I argue that patterns of injustice, including those related to gender and economic inequalities, are not best understood as patterns of the distribution of income, goods, or harms, but rather as patterns of perception and knowledge created through processes of normalization. To study the injustices related to environmental change, we need more than a descriptive account of who is poor and female, and where. We need an account that reveals the dynamic processes and power relations that render the sight of poor women looking for water after a cyclone, or adolescent girls working in a garment factory, signs of injustice. I argue that dynamic processes and power relations render certain social inequalities invisible (or their unjustness invisible) when they are familiar, frequent, or fragmented. Importantly, all three operate below the surface such that they not only render certain inequalities and injustices invisible, but they simultaneously render the social processes and the cognitive processes that conceal them invisible as well. In the following section, I describe a meta-methodology for doing so.

9.2.1 Familiar

Familiarity can render the unjust aspect of some conditions invisible. This can be true even for those of us who are attentive to the possibilities of injustice. For example, the conditions in southwest Bangladesh are familiar: erosion of embankments that protect lands below the high-tide levels, seasonal flooding due to the annual monsoon, seasonal and annual adjustments in sources of livelihood to adapt to availability of resources, exposure to cyclones, and extreme poverty. They are familiar to the people who live there and to those who study Bangladesh. These sorts of environmental vulnerabilities are also commonly referred to by those concerned with environmental justice including climate justice (Caney 2009; Gardiner 2009; Parry et al. 2007). However, the impacts of these are not the same across the affected populations, and these differences are not morally arbitrary. The fact that they are familiar should not inure us to the injustice of their causes. Nor should their familiarity make us see the causes as more uni-dimensional than they are.

The three issues most familiar when talking about Bangladesh and climate change are the rising sea level, the lack of sufficient fresh water, and vulnerability to cyclones. Their causes are not just global warming or climate change, and international politics alone will not address them. I use the first of these to illustrate the problem with focusing on such a familiar, but incomplete, account of a problem.

The dependence of people in Bangladesh on embankments to protect their lands from tidal rivers, which are saline and can rise above the height of their lands, is well known. These embankments are vulnerable to erosion due to the physical properties of tidal rivers in this region and due to local re-engineering of the embankments (in some places they are just too low). The rivers are themselves affected by the fact that so much of the tidal landscape of the southwest is now

embanked and protected from flooding. These protective measures prevent the dissipation of tidal energy that would occur naturally when the tide floods onto unembanked land—as it does in the Sunderbans mangrove forests nearby. Instead, tidal energy is concentrated into the channel systems, leading to even higher high-tide levels. The shift in tidal energy from some places to others disturbs the balance of the natural tidal channel systems, causing some places to experience extreme tides and others to experience diminished tides. The embankment project, which began in the 1960s, created work opportunities for low-income workers and increased agricultural productivity on the newly protected land. The embankments are managed with international funding, national governance, and local politics. It is these politics and not only global warming that are contributing to the vulnerability of communities in this region. Global warming is contributing to the centimeters rise in the eustatic sea level and may lead to a rise of three to four meters in the future. But today, the rise in the level of high tides is due to tidal amplification caused by the man-made embankments. That is, the *effective* sea-level rise that people who live in the region experience (Pethick and Orford 2013) is affected by dynamics other than climate change.[3] The risks of rising sea-levels associated with climate change is a critical part of a familiar story, as data shows the Antarctic is melting more quickly than predicted (Gillis and Chang 2014; Joughin et al. 2014; Mortillaro 2014; Sumner 2014). However, this hides the more politically complicated dynamic that renders populations vulnerable to rising sea-levels and other more immediate environmental changes that have already taken place, such as the rise in high-water levels due to the increasing height of high tides.[4]

Familiarity can also work another way. People can blame something familiar—like Cyclone Sidr (2007)—for a food crisis, and as a consequence the real causes (higher production costs and demand globally, and speculation) remain unexamined and invisible. The 2008 global food crisis was not an accident of nature. In fact, it was due to structural causes intersecting with economic hierarchies and political decisions that caused a crisis of survival for many living in poverty (Christiaensen and World Institute for Development Economics Research 2009; UNCTAD Secretariat 2008).[5]

Not all aspects of social inequalities related to the environment are easily discerned even with significant effort. And those dimensions that can be discerned cannot always be distinguished because they are related to one another in some obvious, but many nuanced and not easily visible, ways. Familiarity does not

[3]According to Steve Goodbred's analysis of these data, tidal amplification is part of an adjustment process and not a linear trend that will continue into the future. While the data are not clear, it looks like it is already slowing down and should continue to do so. If this interpretation of the data is correct, the rise in high water due to tidal amplification is likely to halt in the foreseeable future.

[4]As Jonathan Gilligan clarifies, up to now and perhaps for a few more decades, embankments dominate, but by the middle of this century it is very possible that eustatic sea-level rise will be faster than any additional changes due to poldering. (See also Joughin et al. 2014; Rignot et al. 2014).

[5]Some of these are highlighted in an Oxfam report that is available online (Green et al. 2010).

explain why a set of conditions are unjust. However, awareness of the function of familiarity in discouraging investigation into the complex causes of that injustice may signal the need for richer data and deeper analysis.

9.2.2 Frequent

Many of the conditions that contribute to the narrowing of livelihood opportunities seem directly related to the frequent, repeated, and rational choices of individuals, communities, and government development projects. Frequency can be taken as a reason not to examine the forces behind market forces or the coercion behind choices to take one line of work or another. For example in Bangladesh, poor landless people are entitled to state-owned *khas* land, usually land created by man-made or natural processes such as sediment deposits (FAO 2010). Often, landless people live on or near this land, perhaps on a road, and cultivate the *khas* land. Yet in the southwest, where tidal channels have silted in, creating significant new areas of *khas* land, those lands are often used for large-scale shrimp aquiculture. The frequency with which the landless lease these lands (or sell them) to the shrimp industry suggests this is an attractive economic choice. This *choice* may be attractive compared to other options. But when we assess the context, many factors combine to constrain the choices of landless or *khas* land holders: small-scale corruption in the process of claiming *khas* land; coercion through physical or economic pressure to lease, sell or cede land for shrimp aquaculture; and local systems of monopsony selling, by which farmers with no savings borrow agricultural inputs from the person to whom they will ultimately sell their outputs.

Similarly situated people make similar choices because global, national, and local, formal and informal institutional policies constrain their choices to a narrow set. In the communities of the southwest, the power of the shrimp industry is felt at the local level, but it is not localized. Embankments protect agricultural land from tidal flooding. Engineered mechanisms for managing the tidal flow between the land and river enable shrimp farming, which can use saline intertidal river water to fill its ponds and tidal flows to clean the ponds. The national economic need for foreign exchange, rent-seeking domestic investors, and the availability of international financing for industrial-scale shrimp farming for export, all encourage conversion of land use to shrimp farming. For villagers that converted to shrimp farming, the food economy was transformed from a subsistence economy to a market economy, making people more vulnerable to the market price for food. And so, people in need of new sources of livelihood migrate to places of employment, if they can afford to do so. This includes short-term migration to help with seasonal harvests in other parts of the country or long term to work in shrimp processing factories, garment factories, or ship-breaking (industrial recycling) yards, in Bangladesh or overseas. For those whose livelihoods are displaced by the shrimp industry, the number of options for income are limited and many who cannot afford

to migrate for seasonal work get caught in a monopsony borrowing and selling relationship, becoming increasingly burdened with debt.

I have focussed on the frequency with which the land that is ostensibly for landless people gets converted to shrimp farming, suggesting that the frequency with which this has been happening in the southwest is evidence of exploited economic and political inequalities, not of morally neutral market forces. In this light, we can also look at the decision to migrate for seasonal agricultural work or for factory work as similarly not morally arbitrary but also a consequence of these and other political and economic inequalities. Migrants are not independent actors choosing from a broad range of options. They are people whose livelihood choices are constrained by where they lived. These constraints can never be read as natural because so much of the natural environment—physical and biological—in Bangladesh has been affected by human actions. People used to say that they could fish for a day and feed their families for a week. Now the familiar village fisheries have less fish due to a combination of by-catch (Davies et al. 2009) and silting-in of river channels (due to the embankments as mentioned above). Unable to feed their families with the protein they catch, people have to earn more income. Their choices of alternative livelihoods are likewise constrained, though by different forces. Shrimp factories and garment factories are two common and growing employers in Bangladesh. Families are aware of the health risks in these sites, so when possible they send one person for 3–5 years and then another.

As with familiarity, frequency does not determine whether or explain why a pattern of land tenure or employment is unjust. For that, we must look at the underlying, often quite complicated, dynamics. Frequency explains why the pattern and the injustice that causes it are often invisible even though the practices and outcomes are commonly known. Additional analysis of the underlying political, economic, and social hierarchies illustrate why these constraints and the frequency of these patterns of employment are not morally arbitrary. A full account of the methods for studying the underlying complexities is beyond the scope of this chapter. However after describing the third factor behind invisibility—fragmentation—I will offer some general feminist methodological commitments that are foundational to any such inquiry whether the concerns have to do with gendered inequalities or other forms of social, economic, and political hierarchies.

9.2.3 Fragmentation

We are used to looking for injustice and social inequalities in large patterns. However, whether experienced by 1.4 billion (the number of people living in poverty),[6] by 3.9 million (the number affected by Cyclone Aila in 2009) (United

[6]The population in poverty in 2005. http://iresearch.worldbank.org/PovcalNet/povDuplic.html, accessed October 26, 2010.

Nations 2010), by 3447 (the number who died in Cyclone Sidr in 2007), or by two (the number killed in a land dispute in southwest Bangladesh on April 3, 2012) (Correspondent 2012), the causes of injustice are more visible when we look within the categories of affected people. We must do that to understand the hierarchies that hide the injustices experienced in ways that fragment the affected and render their numbers difficult to count.

Whereas familiarity and frequency can make the unjustness of certain patterns invisible, some injustices are invisible because they are *unfamiliar* due to their unique or circumstantial harms. Because of their uniqueness, some harms appear to be experienced in small numbers. As a consequence, tacit epistemological views about the nature of injustice cause these harms to be approached as consequences of bad choices or bad luck. Fragmentation of harms functions differently from familiarity and frequency. While familiar and frequent inequalities are often visible and it is their *injustice* that is not visible, fragmented harms are often invisible. The example that first made me aware of this form of invisibility came to my attention in a talk by Srilatha Batliwala (2008). She argued that a prolapsed uterus was an invisible consequence of head-loading—the practice of carrying fuel or water on one's head. With environmental degradation, women and adolescent girls often carry close to their own body weight on their heads. In addition to the caloric demands of such labour and, therefore, its impact on malnutrition, a prolapsed uterus can contribute to mortality in childbirth, particularly unattended births (Arupkumar et al. 2006). Of course the social, economic, and political dynamics that produce such an outcome are unjust. However, the point is that maternal mortality, exacerbated by head-loading, like so many other harms that are experienced in ways that do not get counted or that get attributed to other causes such as bad luck, are an unexamined consequence of social inequality. These consequences are fragmented and therefore often unnoticed, though if noticed, would be seen as unjust.

Feminist analysis reveals that fragmentation can be patterned and the pattern is often hidden at the intersection of poverty and gender. Consider, for example, the 8:1 death ratio of women to men in environmental disasters spanning the global from 1981 to 2002 (Neumayer and Plümper 2007). Or consider that in the 1991 cyclone and floods in Bangladesh, 140,000 people between the ages of 20–44 were killed. Of those, 71 in 1000 were women whereas only 15 in 1000 were men (Dankelman et al. 2008, p. 51). To understand the gendered nature of injustice in natural disaster, it is worth considering the gendered mortality of this 1991 cyclone. Intersectional analysis of the disaster reveals what data about poverty cannot. While the cyclone was forecast, early warning systems were inadequate. Those who were able to make it to concrete shelters survived. Twenty-two percent of those who did not make it to shelters died (Bern et al. 1993). Men learned of the imminent risk in the market and other public areas where rural women did not frequent. Men went to community shelters. Even when they started to feel the effects of the storm, due to a cultural responsibility for their homes and modesty, women did not go unaccompanied to such public places (Begum 1993). Consequently, the death rate of women was nearly five times the death rate of men in the same age group (Aguilar 2004).

Across Bangladesh, improvements in cyclone preparedness from 1991 to 2007 were primarily due to the construction of cyclone shelters and to some extent early-warning systems. Data collected locally by small NGOs (working in different villages and not in all villages) suggests that while the mortality rate was lower for Cyclone Sidr (3447 in 2007) and even lower for Cyclone Aila (193 in 2009), disproportionately more women aged 20–44 died in both. This is due to a combination of gendered behaviours during natural disaster as well as gendered behaviour norms. We should not need an environmental disaster to bring into focus the underlying dynamics and relations of power that contribute to these non-random differences in mortality and to understand these as unjust. Fragmentation does not explain the causes of the harms, only why the underlying injustices are invisible until environmental events or analysis reveal the injustice. An environmental event may precipitate the visibility of certain injustices. However, justice requires that we not wait for such events, but rather develop concepts and methods for revealing and analyzing their unjustness.

9.3 Implications

In southwest Bangladesh, changes in the global and national political economy encouraged changes in the local engineered environment. This in turn fostered changes in the local environment and changes in the ability of the people living in poverty to adapt to their environment. At the local level, each of these changes seemed familiar, even natural and not exceptional, to affect only small numbers, or to be frequent, market driven, and rational. Perhaps they were the consequence of bad luck or bad choices, but not of complex social, economic, and political inequalities. However, by looking at the particular case of southwestern Bangladesh —and any other particular case where *familiarity, frequency*, and *fragmentation* render injustices invisible—the experience of harms associated with the transformation of the economy of this region is not morally arbitrary. For all but those who experience them, the impacts of these changes are concealed by their familiarity or their frequency. For all but those who experience them, the plausible injustice of these harms is concealed by their fragmentation.

The processes behind the injustices are ongoing social, economic, and political in nature. But the consequences of these processes may not be visible until these specific constellations of conditions are studied or a natural disaster brings the vulnerability caused by these processes and hierarchies to the fore. Concern for the social, economic, and political inequalities behind the injustices needs to be important to us prior to random or environmental change-induced events reveal their human cost.

The next section reviews the methodological implications of our awareness of these potential observational biases.

9.4 Research Directions

From the front lines of climate change impacts, we can see that given the complexity of the intersections of local and global, physical, engineered, and social process, dynamics and relations, there is not a simple or singular research agenda that can sufficiently guide public policy in the area of environment and social justice. If there is no simple story in southwestern Bangladesh, where the land is already below sea level and poverty levels are high, there is no simple story anywhere. McLeman calls us to this project (2014). Though the problems are not simple, some broad methodological commitments can lead research into environment and social inequality that can clarify without oversimplifying.[7]

However, my analysis of the ways in which injustices and their underlying causes get hidden in plain sight suggests the value of certain broad methodological commitments for the study of environment and social inequalities. These are meta-methodological commitments, regardless of disciplinary background.

9.4.1 Interdisciplinary Analysis

The problems of environment and social inequality are too large to be pursued without connections across disciplines. I am a political theorist. I have not conducted my own sedimentological or hydrological research. Through my interdisciplinary collaborations, I am aware of the ways in which the physical dynamics of the rivers interact with the engineered environment to transform the environment in which people live, creating pressures and opportunities that effect different segments of a population differently.

Consider just one example of the import of the connection between social science and physical science research, particularly as it pertains to matters of social inequality. Through our trans-disciplinary collaboration, we have learned that, while sea-level-rise risks causing saline inundation of land currently protected by embankments, the embankments themselves are exacerbating the impact of sea-level rise and storms on land outside the embankments.

Where there are no embankments, the energy in the tidal waters carries water and sediment over the landscape. Where the rivers are embanked to protect the land, the tidal waters move further up the channel and have greater amplitude. In a storm, more land is therefore at risk of saline inundation than would otherwise be the case. This means that some land experiences the forces of erosion more intensely than it would otherwise. These physical and engineered dynamics have implications for social inequality as well. For example, the engineered embankments make certain

[7]The distinction between clarifying and simplifying was first made by Srilatha Batliwala as she sought to develop evaluation mechanisms that reveal the challenges of working for women's rights in contexts of complex social, political, and economic norms.

lands more suitable for aquaculture. Growth in this industry across the region can be observed through satellite imagery and analysis.[8] The embankments allow both agriculture and aquaculture, but when the interior lands are used for aquaculture, the population is more vulnerable to storms. Whereas the labour for agriculture and aquaculture is local, due to the lending and monopsony-pricing practices, the economic benefits of shrimping are realized by those who live outside of the community.

The local forms of inequality created by the shrimp aquaculture cannot be viewed through satellite imagery. There are many micro-economies that contribute to these new inequalities. For example, there is the decreased ability of middle-class women to provide lower-class women with consumption smoothing loans from their personal savings. In a shrimp economy, there are fewer middle-class households and the women of these households do not have the means to save money by setting aside some rice as is their traditional practice. They, therefore, cannot provide short-term loans as they once did.

Understanding the ways in which environmental issues create problems of injustice requires interdisciplinary research into social, economic, political, and environmental dynamics.

9.4.2 Integrated Analysis of Local, National, and Global Dynamics

The study of environment and social inequalities needs to integrate the study of global, national, and local political and economic forces. Consider the dynamics of *khas* land described above in the discussion of normalization through frequency. The local processes that determine the entitlements to *khas* land and its uses have a greater impact on who are displaced by environmental change than does sea-level rise. However, it may be more interesting to consider the ways in which the global and national dynamics of foreign aid, used here for the development of the polder system, *contributed* to the emergence of *khas* land. Again, hydrology is helpful to understand that the creation of the polders constricts the flow of water and causes deposition of land in certain channels, thereby both creating new land resources and limiting fishing resources.

The interaction of the spatial scale of global (river and tidal processes), national (dynamic river delta), and local (khas land) is not just in the environmental dynamics of the region. There are similar dynamics (related to these environmental processes) at work in the political economy. For example, international Cold War politics contributed to the funding of the costal embankment project in what was then East Pakistan (an important United States ally against Russia and India). After independence, competition among politicians for legitimacy in the newly

[8]In our project, this work was done by Chris Small.

independent state of Bangladesh led to both the continuation of the embankment project and the commitment of giving *khas* land to landless people. And, in any given locale, local power dynamics effect who is given title to the land. Even among people who are landless, in a given location, those who rely on fishing in the channels for their livelihood can see their livelihood options decline while others enjoy an increase in stability through land acquisition.

Similarly, the combined pressures to convert land use to shrimp farming coming from international sources willing to fund development of the shrimp farms, national political incentives to support such development, and local investors' income potential posed (and continues to pose) a threat to some livelihoods while increasing opportunities for others. The consequences of these are not random, natural, or morally arbitrary; they have everything to do with social, economic, and political practices.

While it is obvious from these examples, an additional implication is that integrated analysis means looking at historical processes and their path dependencies. By that I mean an engineering and foreign- aid decision made in the 1960s has implications for the physical landscape (annual sediment load from the rivers has to go somewhere else if it cannot get onto the land due to embankments) and for the long-term sources of livelihoods (affecting different populations differently depending on other dynamics). Integrated analysis requires looking backward at historical processes and forward toward likelihoods of future conditions.

Even though the multiple forces that create complex dynamics and intersecting hierarchies mean that we cannot identify all the parties who should take responsibility for these harms, we should still view these environmental and social dynamics as matters of injustice. By looking beneath the broad patterns of environmental change and poverty, we see that injustices are inextricably parasitic on social, economic, and political hierarchies in ways that perhaps render the injustice of these hierarchies invisible. Epistemologies of the familiar invite us to lump together all those experiences together as being the consequence of undifferentiated poverty. Epistemologies of development expect and encourage the growth of export industries and conceals the injustice behind the broad pattern of increased labour in the export industries and the frequent choice of families to rely on income from these sectors. Epistemologies of fragmentation makes the impact on disassociated categories of people seem unrelated. Although plausibly less visible, these hierarchies *are* matters of injustice.

Focusing on *ways of making the patterns of injustice visible* means studying the ways in which forces local, national, and global interact.

9.4.3 Intersectional Analysis

A third methodological implication of the problems of normalization in the study of environment and social inequalities follows from the preceding. If social, economic, and political hierarchies are so determinative of how people experience

environmental change, then all studies of environment and social inequalities need to draw on our best tools for studying such hierarchies. These come from feminism, post-colonialism, anti-racism, and some forms of critical theory.

Intersectional analysis—a tool pioneered by U.S. feminist theorists for the study of race and gender (Crenshaw 1989; Hancock 2007; McCall 2005; Weldon 2006) and by Indian activists fighting against colonial rule and its gender and caste dimensions[9]—is a tool that is useful for any study of complex processes in which there are multiple interrelated hierarchies (Ackerly 2011; Risman 1993; Spivak 1993). While scholars disagree on what intersectionality requires specifically, in general it means studying the ways in which multiple axes of injustice might be at work in either the construction of a problem of injustice or in our failure to analyze such problems well.

Intersectionality is a feminist meta-methodological tool for understanding the complex ways in which seemingly distinguishable hierarchies can function in confluence to create harms that affect subgroups within a population. It guides inquiry to reveal the invisibility of the oppression people experience when they are at the intersection of multiple axes of oppression. It reveals the oppression and the inadequacy of non-intersectional approaches to oppression. For example, it reveals the sexism in some anti-racist activism and the racism in some anti-sexist activism. Even when made visible, these biases may be treated by society and policy makers as only marginally important questions of justice.

Intersectional thinking provides a useful methodology for discovering social, political, and economic hierarchies and the ways that these can render the number affected by an injustice seemingly small, the basis for a claim to justice seemingly unjustified (because it is arguably a consequence of individual choice), or the claim itself seemingly unwarranted (because the injustice is a familiar norm). Some circumstances are accidents of nature (for geographic reasons some populations are more cut off from markets, healthcare, and educational resources than others). But underlying most circumstances, even geographic context, intersectional analysis reveals political explanations—perhaps historical political reasons—for why particular populations experience intense deprivations. Consider that under conditions of income shortage, the resources within a family are distributed according to cultural patterns which often mean that females experience more acute hunger in a food crisis (Dwyer and Bruce 1988; Sen 1990; White 1992). To understand these differences, we need methodologies to study historical international relations, colonization and decolonization, gender, race and ethnicity, and other ways in which hierarchies function through categories such as sexuality, disability, nationality, age, immigration experience, work experience, and identity (Locher and Prügl 2001).

Intersectional analysis is what I used in the discussion of fragmentation (Sect. 9.2.3) about the gender mortality differences in cyclones, and vulnerability more generally. Without intersectional analysis of poverty and gender, the impact

[9]For a review of this historical literature see Rao (2003, 2006).

of the storm looks like the natural consequence of a severe storm hitting a country with many impoverished people, who had no access to shelter from the storm. However, intersectional analysis shows that among people living in poverty, poor women aged 20–44 were more likely to die than men of the same age. Without the intersectional analysis of poverty, gender, and the availability of cyclone shelters, the familiarity of death due to natural disaster renders invisible the injustice of this disaster. Moreover, we need intersectional analysis to explain why even though the mortality of men and women has declined with greater disaster-preparedness, the disproportion of female to male deaths remains similar when a cyclone hits.

The variety of conditions and contexts of natural disasters has made the gendered pattern of mortality in a natural disaster invisible to all but the immediate survivors and disaster relief workers (Begum 1993). However, if we understand the reasons for the different mortality rates in each disaster, we would understand why these deaths and the conditions that contribute to them are injustices. Although the particulars differ by place, these mortality rates follow social and economic hierarchies, and these differences enable us to anticipate the differences in mortality. When environmental harms follow the patterns of hierarchies, they raise questions about the justness of social inequalities more generally.

9.5 Conclusion

The argument that I have made speaks to the nature of responsibility for social and environmental injustice. Given the role of social, economic, and political forces in the differential impacts of environmental change, the political responsibility of academics is to inquire into these dynamics (Ackerly 2013). This chapter argues that as academics, our professional responsibilities are to deploy broad methodological commitments to connect our research with that of others through interdisciplinarity, integrated analysis from local to global scales, and intersectional analysis of social, economic, and political forces of marginalization and normalization of inequalities. These broad meta-commitments are essential if the study of environment and social inequalities hopes to reveal and mitigate these, not just document them.

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Chapter 10
Migration, Environment and Inequality: Perspectives of a Political Ecology of Translocal Relations

Clemens Greiner and Patrick Sakdapolrak

Abstract Research into the relationship between environment and migration—particularly how the environment influences the decision to migrate—has gained currency in the last decade. However, the growing body of recent environmental-migration literature exhibits an under-theorized and depoliticized notion of the environment. Furthermore, migration is usually perceived as an emergency response, a one-time movement, neglecting the often inherent circularity and continuous effects of migration. In this chapter, we introduce the concepts of translocality and political ecology as a means to address this lapse. We also propose a political ecology of translocal relations as a framework for research into the migration-environment nexus. This to be an important issue in this time of mounting and often reductionist debates.

Keywords Internal migration · Translocality · Political ecology · Human-environmental relations · Rural development

10.1 Introduction

For several decades in the latter half of the 20th century, the influence of the environment virtually disappeared from migration research (Piguet 2013). In the past few years, however, scholars have turned their interest to the relationship between migration and the environment, and a growing number of studies have contributed to a better understanding of this multifaceted and complex relationship (see Black et al. 2011; McLeman 2012; Sakdapolrak et al. 2013). In the context of

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global environmental and climatic changes, a large portion of environmental-migration literature displays a strong concern for environmental factors as the underlying causes of mobility. Concomitantly, new terms and categories, such as *environmental migrants*, have rapidly gained currency. Looking at the recent scholarly endeavors, we make the following two observations:

- In environmental-migration literature, human-environmental relations are often under-theorized and depoliticized, and the environment is seen as a natural and external (push-) factor.
- A simplistic view of migration as a one-time event prevails in environmental-migration literature, neglecting the often circular character and feedback processes of migration, which can have significant impacts on local environments.

In this chapter, we address these points and look at how both the environment and migration are conceptualized in much of the current literature. We also explore the potential of tackling some of the blind spots by applying the concept of a translocal political ecology to the study of the migration-environment nexus, and to the more neglected field of environmental impacts of migration. We are aware of the large body of literature on vulnerability in the context of famine, drought, and disaster (Little et al. 2001; Oliver-Smith 2009; Smucker and Wisner 2008; Watts and Bohle 1993) that has addressed the issues of displacement and (forced) migration. This strand of research has thoroughly interrogated environmental hazards while analyzing the political ecology of risk exposure. It generally concludes that vulnerability is mediated by unequal power relations and varying combinations of factors, the environment being only one and not even the most prominent in most circumstances. While this literature points to important (potential) drivers of migration, it usually deals with migration as one of several response options and often does not examine migration processes in more detail. As such, migration tends to appear only as an emergency response and forced reaction to external pressures or shocks, and not as an everyday life experience and proactive adaptation. We hold that factoring in the concept of translocality (Brickell and Datta 2011; Greiner and Sakdapolrak 2013b) offers a chance to grasp the manifold dimensions of human mobility in relation to environmental factors.

Following a short critical review of some of the current literature, we briefly introduce the concepts of translocality and political ecology. We then suggest a *marriage* of these fields and argue that this is an important step toward a more holistic understanding of the interlinked dynamics of environment, migration, and inequality. Unlike the older concepts of transnationalism, translocality explicitly acknowledges place as a historically specific node where migrant networks are rooted and where particular flows converge. We propose that this notion of place as an arena for the "power geometry of time-space compression" (Massey 1991 [25]) renders the concept of translocality a field with potential for fruitful engagement with political ecology approaches. In conclusion, we suggest some critical research perspectives for a political ecology of translocal relations.

We begin with a brief outline of the way in which the environment is conceptualized in the different research strands and highlight the blind spots of this perspective.

10.2 Environmental Factors as Drivers of Migration

In the literature on the migration-environment nexus, most studies focus on the environment as a driver, determinant or trigger causing different mobility patterns. This includes a broad range of types of threat, such as fast- (e.g., tropical storm) and slow-onset events (e.g., drought, desertification) as well as processes that are more (e.g., industrial accidents) or less (e.g., tsunami) linked to human activities (see overview Morrissey 2009). The array of mobility patterns in the context of environmental stress—expressed in terms such as environmental migrants and refugees or environmentally related displacement and relocation—can be found on several axes that are part of multiple continuums. Oliver-Smith (2006 [3]) identifies them as: (a) proactive—reactive, (b) voluntary—forced, (c) temporary—permanent, and (d) administrated—non-administrated. Recently, the complex issue of migration into risk areas has been highlighted as a dynamic that exacerbates people's exposure to environmental hazards (De Sherbinin et al. 2012). Examples include the massive population increases in the Bangladeshi floodplains or in hurricane-prone areas of the U.S. (Hunter 2005), or the rapid urbanization and slum formation (Sakdapolrak 2010).

In environmental-migration literature, a distinction has been made between the so-called alarmists or maximalists on one hand and the skeptics or minimalists on the other [see Morrissey (2012) and Piguet (2013) for an overview]. Maximalists (e.g., El-Hinnawi 1985; Jacobson 1988; Myers 2002) consider environmental factors as the primary and often sole cause of migration. In this literature—which is strongly fuelled by environment and security discourses—the discussion often revolves around the concept of *environmental refugees*. Emphasis is put on the question of who can legitimately be categorized as such, and on estimates and predictions of their potential numbers. In some of the literature, alarmist concerns focus on how environmental migration poses potential security threats and/or may result in social unrest in destination areas (WBGU 2007). Following the lead of authors like Homer-Dixon (1999), human-environmental interaction in this latter perspective is often considered in a more or less straightforward neo-Malthusian eco-scarcity chain of arguments (e.g. Scheffran and Battaglini 2011). An example is Myers (2002 [609]) who refers to "drought, soil erosion, desertification, deforestation and other environmental problems, together with the associated problems of population pressures and profound poverty," as the causes of migration.

Minimalists or skeptics criticize such approaches on political, empirical, and theoretical grounds (see Oliver-Smith 2012). On a political level, they question the alarmist narrative from a discursive and political-economic perspective, asking whose interest the environmental-migration narrative serves and what effects it has, while pointing to the hegemony of the discourse and the role played by power relations (e.g., Bettini 2013; Farbotko and Lazrus 2012; Hartmann 2010; Kibreab 1997; Wisner 2009).

On a theoretical level, minimalists argue that migration decisions are not triggered by environmental factors in a simple and mechanistic way, and that such

factors cannot be separated from other factors that have an impact on migration, be they social, political, or economic (Black 2001). Environmental change is considered an amplifier of existing migration processes (Tacoli 2009). This understanding, which is promoted by the UK government-sponsored Foresight Report (2011), has recently become the authoritative view in the research community. This framework, however, as Black et al. (2011) highlight, only provides a checklist of potential factors influencing the migration decision without specifying the relationships among these factors.

In the approaches outlined above, we identify three ways in which human-environmental relations are conceptualized:

(a) Environmental pressure as external, *hard* fact
In most studies, environmental changes, as well as the exposure and impact of environmental events on population, are considered as given, external facts. These studies often start with the description of specific trends and events, and seek to relate them to specific patterns of migration (e.g., Henry et al. 2004).
(b) Environmental pressure as an outcome of population-resource interaction
"Climate determinism and reductionism" prevails (Hulme 2011) and the focus is on the unidirectional and often quantitative relationship between resource availability, population growth, and migration (Homer-Dixon 1999; Reuveny 2007; Myers 2002; Bogardi and Warner 2009; Scheffran and Battaglini 2011).
(c) Environmental pressure as mediated by socio-economic factors
Environmental pressure is seen to affect migration through a range of mediating factors. Often, however, it is not explicit how the environment is linked to other factors and how these inter-linkages influence the migration decision (e.g., Carr 2005).

To sum up, we argue that current perspectives of the migration-environment nexus often suffer from a problematic naturalization and a depoliticization of human-environmental relations. Where this is not the case, the relation between migration and environment is often conceptualized only vaguely. We now turn our attention to the question of how migration is conceived in much of the current environment-migration literature.

10.3 Environmental Migration: Between Permanent Displacement and Feedback Processes

Looking at the way migration is conceptualized in the environmental-migration literature, we observe a preoccupation with terms such as *environmental refugees*, *environmental migrants* and *climate refugees*. These are emerging and not (yet) clearly defined categories of migrants, the empirical significance of which is still debated (e.g., Bates 2002). Related to this debate, the dynamics of migration described in this literature are often framed as one-time movements, individual acts

of permanent relocation in response to emergency, and a last resort for dealing with environmental stress. As a consequence, there is a tendency to view migration as a severing of social ties to the place of origin. The various ways in which migrants maintain relations to their places of origin, the resulting dynamics of that connectedness, simultaneity and feedback processes, and the impact permanent relocation has on the former home areas are seldom considered.

These shortcomings do not pertain solely to the environment-migration nexus and have been pointed out repeatedly by migration scholars. De Haas (2010 [1587]), for example, deplores the neglect of the "indirect feedback dynamics that operate through the impact of migration on the sending and receiving contexts." There is also the concern that the impact of migrant social networks on the environment, according to Curran and Agardy (2002 [97]), is among "the least theorized or conceptually evolved in the migration and environment literature." Scholars of rural-to-urban migration have highlighted the importance of such processes of circulation and interaction in Asia (Deshingkar and Farrington 2009), Africa (Geschiere and Gugler 1998), and Latin America (Paerregaard 1997), and pointed to their growing importance. In a similar vein, the World Development Report (2014) concludes that "temporary migration for work from rural to urban areas is the dominant form of migration; there are 740 million internal migrants worldwide, nearly four times the number of international migrants" (World Bank 2013 [121]). While stressing the importance of internal circular migration, we do not mean to downplay the importance of international migration and displacement. Yet, we hold that future dynamics of the migration-environment nexus are highly uncertain, and it therefore remains notional if environmentally associated migration in the 21st century resembles past patterns of migration. Tacoli (2009 [523]) notes "…it seems unlikely that the alarmist predictions of hundreds of millions of environmental refugees will translate into reality. What is more likely is that the current trends of high mobility, linked to income diversification, will continue and intensify." This view is also reflected in the lPCC reports of 2007 (Parry et al. 2007) and 2014 (IPCC 2014), which, although acknowledging the fact that climate change will increase displacement, refrain from making definitive statements on future flows and dramatic changes of patterns of mobility (for an overview see Bettini 2013 [65–66], Ober 2014). We therefore argue that it is important to have a better understanding of the dynamics of the multifaceted and often neglected environmental impacts of migration, in order to understand future scenarios. This is particularly important with respect to the emergence, patterns, and functions of migrant networks, the consequences of simultaneity, and the multi-local embeddedness of those involved and their impact on migrants home and host areas.

Two recent strands of literature address these points. The migration-development-nexus literature emphasizes the increasing importance of hometown associations, business networks, and diasporas in the context of international migration for the development of the areas of origin of migrants (Faist 2008). There is also a growing body of literature that examines the environmental impact of migration on areas of origin (Davis and Lopez-Carr 2010; Greiner and Sakdapolrak 2013a; Moran-Taylor and Taylor 2010; Robson and Nayak 2010; Qin 2010). This

literature provides evidence of a distinct relationship between migration and the environment in rural-sending areas, particularly as it relates to agricultural change, land-use patterns, and soil conservation.

To summarize, while there is still a tendency to view environmental migration as a one-time emergency response, there is a growing body of literature that acknowledges that migrants and non-migrants are embedded in multi-local networks of social and socio-ecological relations. In light of these trends, it is important to reflect on the entanglements and feedback loops in the environment-migration network and search for suitable, non-deterministic frameworks instead of ringing the alarmist bell. It can be argued that the emerging concept of translocality provides a promising research perspective to capture this relationship. In what follows, we first describe a translocal perspective on migration then introduce the idea of a political ecology.

10.4 A Proper Marriage: Translocality Meets Political Ecology

Conceptualizations of translocality usually build on early research into migration networks and remittances, and on the concepts of transnationalism (Smith 2011; Greiner and Sakdapolrak 2013b). While acknowledging the important contributions of transnationalism, especially with respect to the dynamics of multi-local embeddedness, simultaneity, and spatial connectedness, a translocality approach seeks to overcome some of the conceptual limitations of this well-established research perspective. The analytical focus of translocality expands beyond the limits of the nation state and seeks to integrate socio-spatial configurations, not just those induced by human migration. This includes symbolic flows, memories, imaginations, and *immobile* populations (Brickell and Datta 2011). Scholars of translocality question the overemphasis on de-territorialization, unboundedness, and fluidity of social spaces described by supporters of transnationalism (Pries 2003). In short, while earlier transnationalist approaches tended to emphasize space over place, translocality acknowledges that migrants remain anchored to specific places. As Brickell and Datta (2011 [3]) put it, there is always some degree of "situatedness during mobility." Place, in the translocal perspective, constitutes a historically specific node where migrant networks are rooted and where particular flows converge (Greiner 2010; Zoomers and Westen 2011).

The concept of translocality, while explicitly addressing dynamics that transcend local arenas, was born of a skepticism of the approaches that do not acknowledge the local embeddedness of socio-spatial relations. By contrast, political ecology, a concept that emerged from a critique of allegedly bounded and isolated local arenas, has only recently begun to theoretically engage with the networks and relational dimensions of human-environmental relations (Neumann 2009).

To begin, we must point out that, as with the concept of translocality, there are many definitions of political ecology and several home disciplines—such as anthropology, geography, and history—within which political ecology has currency. We will not go into these details nor will we priorize any of the current strands in this field of theory and research. Suffice to say that most political-ecology approaches draw on a broad and heterogeneous range of literature from feminist, institutional, and discursive approaches to cultural ecology and neo-Marxist theories to explore the complex sets of human-environmental relations and to counter apolitical eco-scarcity, ecosystem, and modernization accounts (Robbins 2004).

The term *political ecology* was first coined by anthropologist Wolf (1972), who pointed to the need to enrich earlier cultural-ecology approaches with concerns about ownership and political institutions, particularly with property relations and decision-making power. Since then, a wide array of scholars have developed the concept of political ecology, producing "a number of high quality but dispersed studies, that have significantly contributed to our understanding of nature and society relations" (Zimmerer and Bassett 2003 [1]). Many critical scholars have used notions of a political ecology to counter neo-Malthusian-informed understandings of environmental crisis and resource scarcity, which often focus on the quantitative assessment of the relationship between resources and population, and interpret crisis and scarcity as natural results of population growth. The basic premise of political ecology, as represented for example by the work of Blaikie and Brookfield (1987), is to embed ecological processes in the context and dynamics of a broader political economy. The central hypothesis of political ecology is that environmental changes, crises, and conflicts are the products of social relations across scales (Büttner 2001). These changes, crises, and conflicts are the results of interactions between actors who pursue different interests and have unequal agency and power (Bohle 2006). These interactions result in an unequal distribution of environmental profits and costs, in accumulation processes, and in marginalisation and inequality. Political ecology therefore offers an explanation of why the poor and marginalised are often at highest risk from hazards (Adger 2006 [271]) and contributes to the understanding of root causes of social vulnerability (Watts and Bohle 1993; Wisner et al. 2004). In fact, both strands of literature—political ecology and social vulnerability—show a great deal of overlap and cross-references (Adger 2006; Collins 2008; McLaughlin and Dietz 2008; Oliver-Smith 2004).

From the political ecology perspective, certain questions come into focus. These include questions about structural context and framework conditions, the role of power and agency (both place-based and non-place-based actors), and poverty and vulnerability in the context of a politicized environment. A political ecology-informed perspective on what is sometimes framed as *environmental conflicts*, for example, views such conflicts primarily as negotiations over access and control rooted in histories and social relations (Le Billon 2001; Peluso and Watts 2001).

Drawing from scholarly work on political ecology and transnationalism (especially that of Biersack 2006 and Taylor 2011), we argue that a synthesis of the perspectives of translocality and political ecology is a productive way to enhance the understanding of the migration-environment nexus in general and

environmental migration in particular. We hold that this synthesis allows research to address issues and concerns raised in the first section of this chapter. While both perspectives have conceptual commonalities, sharing terms and dimensions, they are nevertheless complementary as they differ in their emphases.

With regard to the commonalities, translocality and political ecology both emphasize the importance of place and scale. Place is viewed in a dynamic and multidimensional way as a node where local-local negotiations (Brickell and Datta 2011) between migrants and non-migrants are grounded (translocality). This is where particular multi-scalar flows converge, and where different sets of actors negotiate to produce a specific configuration of human-environmental relations along with specific technologies and institutions of resource use (political ecology). Both approaches have a shared notion of place as an arena for the "power geometry of time-space compression" (Massey 1991), i.e., for processes of social differentiation and for the generation and perpetuation of social inequalities. Translocality and political ecology approaches also share the basic notion that an understanding of local processes must take cross-scale dynamics and interactions into account. While political ecology emphasizes how local environments are shaped by political, economic, and other forces at levels beyond the local (Bebbington and Batterbury 2001), translocality is concerned with local-to-local connections, simultaneity, and multi-local engagements of mobile and non-mobile actors. We now suggest some research questions that in our view would benefit from the union of these two concepts.

10.5 Toward a Political Ecology of Translocal Relations

The combination of political ecology and translocality has promising potential for the analysis of the migration-environment nexus. On the one hand, the concept of translocality provides us with a framework that allows a better understanding of phenomena related to migration. On the other hand, political ecology gives us a conceptual framework with which to capture the characteristics of the environment and human-environmental interaction (an issue neglected in studies on translocality) in a non-deterministic manner. Building on the work of critical scholars such as Hartmann (2010) and Wisner (2009), we posit that a political ecology of translocal relations should aim to understand human mobility in a politicized environment—an environment that is a product of unequal social relations across scales. The following questions emerge from this approach:

(a) *Who is exposed, where, and why?* In case studies on environmental migration, the exposure of a certain population to environmental stress is taken as fact. In doing so, the over-looked question is why segments of the population are residing in, or being forced to move to and make their living in certain places where they are exposed to environmental stress and/or face the threat of being forced to leave. Drawing on insights from work on social vulnerability

(Wisner et al. 2004), a political ecology of translocal relations considers a specific configuration of population and environment—the fact that certain people are in certain places—not as a random or chance situation but as an outcome of unequal social relations, which often places subordinate populations in areas of higher risks. Environmental migration understood in this manner is a direct result of poverty, inequalities, and risk exposure.

(b) *Who is forced to leave? Who is forced to stay?* Studies show that those who migrate are often not those who are most negatively affected by adverse environmental conditions. Mendola's study in rural Bangladesh demonstrates that better-off households that participate in international migration are likely to employ modern farming technologies, and thus achieve higher yields. Households that are not able to finance cross-border movements are trapped in internal migration, which usually doesn't produce enough revenue to allow investment, but rather proves to be a poverty trap (Mendola 2008). A political ecology of translocal relations addresses the question of inequality within networks and directs attention to participants and outsiders, to winners and losers from cross-scalar practices (Greiner 2011), and highlights the consequences of these relations for those dealing with environmental risks.

(c) *What are the social-ecological consequences of migration?* We have pointed out that environmental change will probably intensify existing migration patterns, which often are circular and non-permanent, and which are correlated with increasing connectedness between areas of origin and areas of destination. A political ecology of translocal relations examines the social and ecological consequences of this relationship. Studies show that feedback processes of migration on migrants' places of origin have an impact on the environment (e.g., Davis and Lopez-Carr 2010; Greiner and Sakdapolrak 2013a) as well as on the way people deal with environmental risks (Deshingkar 2012; Sakdapolrak et al. 2013). This in turn has implications for future (environmental) migration. An example of the former—the impact of migration on the environment—is the well-known study from Machakos District, Kenya, that shows how migration, urban-derived incomes, and remittances have been used to invest in sustainable and successful agricultural production techniques in migrant-sending areas. This has led to an environmental recovery in a formerly highly degraded area (Tiffen et al. 1994). Less well known is the observation that this went along with a "significant polarization of wealth" (Murton 1999 [41]) and sharp declines in the agricultural productivity of those households that did not manage to successfully diversify their incomes. An example of the latter—the impact of migration on the way people deal with environmental risks—is the study by Sakdapolrak et al. (2013) in Northern Thailand. This study shows how feedback processes of migration initiated a transformation of agricultural practices and social organization in a way that enhanced the resilience of the population against environmental risks.

10.6 Conclusion

In this chapter, we proposed a political ecology of translocal relations as a framework for the study of the relationship between migration and the environment. This is based on the observation that the current literature on environmental migration tends to under-theorize and depoliticize the environmental factors, and considers environmental stress as a given, natural, and external fact. Furthermore, we looked at the need for environmental-migration research to acknowledge the circularity of migration processes. We therefore suggest that a political ecology of translocality—which synthesizes both approaches—offers a promising way forward for a more nuanced, non-deterministic understanding of the relationship between migration and the environment.

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Part IV
Policy Reflections

Chapter 11
Framing Labour Mobility Options in Small Island States Affected by Environmental Changes

Elisa Fornalé, Jeremie Guélat and Etienne Piguet

Abstract It has been forecast that up to forty nation-states are at risk of disappearing due to rising sea levels related to climate warming. Such a situation would lead to a form of statelessness never experienced before in history and would raise serious concerns about migration as well as important legal questions. Although often mentioned in the media by NGOs and other international bodies, this issue has rarely been addressed by legal scholars or by social scientists specialized in migration studies. This chapter examines the available literature on the topic and presents basic geographic data to assess the validity of the danger. We then discuss the legal frameworks and policies that could be developed to mitigate the threat of climate change related statelessness, a concept that remains in need of clarification under both international law and human rights law. This chapter seeks to explore legal means to deal with populations displaced by the adverse impacts of climate change, that are consistent with a state's existing international legal obligations. The ongoing debate about this challenge aims to identify normative measures to secure a legal status for forced migrants, who risk becoming stateless when their state disappears.

Keywords Disappearing states · Environmental related statelessness · Adaptation measures · Migration strategies · Human rights

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11.1 Introduction

The 2014 report of the Intergovernmental Panel on Climate Change (IPCC) (AR5, WGII) indicates that climate-change impacts can, in extreme cases, threaten the territorial integrity or viability of states, leading to new forms of statelessness (Adger et al. 2014, p. 20). This possibility has been noted in several studies. Yamamoto states that "…several island nations will probably become submerged in the course of the next century, forcing the relocation of their inhabitants to other countries" (2010, p. 1). McLeman observes that the predicted rise in sea level "… holds the prospect of something for which no direct modern-day analog exists—the disappearance of the habitable land mass of an entire nation, and the rendering of its population physically stateless" (2013, p. 198).

This phenomenon of disappearing states is very present in political, media-centred, and academic spheres, and the *climate refugee* is being called the canary in the environmental coal mine (McAdam 2010). The disappearance of states as a result of climate change brings with it a new form of statelessness never experienced before, which raises serious concerns about migration and important legal questions (Park 2011). As mentioned by Black et al.: "If sea-level rise were to engulf a small island state, for example, it would raise issues of sovereignty, and questions of who is responsible for displaced populations" (Black et al. 2011, p. 448). On this basis, questions need to be addressed in light of current environmental changes: What are the risks of these Atlantis-style predictions for the future? Is it possible that entire nation states will be submerged? What are the legal implications and the potential adaptation solutions if sovereign nations disappear? and How can human mobility options play a role in environmentally affected settings?

This chapter first examines the literature on the topic and presents basic geographic data that allows the danger to be accurately gauged (Piguet 2012; McAdam 2010). We then discuss the legal frameworks and migration policies that could be developed to mitigate climate-change-related statelessness, looking at the interplay between different levels of governance (regional, bilateral and domestic). We will also briefly examine already explored avenues such as adaptation measures to prevent migration and compensation schemes to finance adaptation—forms of restorative measures (under the rubric of loss & damage). We then turn to less explored avenues where migration is seen as a strategy to reduce vulnerability, and to bilateral and regional mobility schemes that could be seen as complementary to other adaptation processes. Finally, we will address the complexity of the interaction between environmental changes, labour mobility, and development, taking into consideration social, economic, and human rights implications to identify mechanisms for lawful movements across borders and their practical implementation.

11.2 The Phenomenon of Disappearing States: A Physical Science Perspective

Climate change and rising sea levels are a source of great concern for the planet. It leads to images of polar bears on melting ice sheets and nation states vanishing under water. Our objective is to estimate future sea-level rise and assess its impact on coastal countries to better understand which ones are at risk for total submersion. In its 2013 assessment report (AR5, WGI), the IPCC predicts different rates of sea-level rise by the year 2100, according to four Representative Concentration Pathways (RCPs). The ranges vary from 0.44 [0.28–0.61]m (RCP2.6), 0.53 [0.36–0.71]m (RCP4.5), 0.55 [0.38–0.73]m (RCP6.0) to 0.74 [0.52–0.98]m (RCP8.5) (IPCC 2013, p. 1180). The worst-case scenario is a rise of almost one metre by the end of the 21st century. Even though the rise in the sea level will not be uniform around the globe, approximately 95 % of the ocean area will experience a rise by the end of this century (IPCC 2013, p. 1140). The countries considered in this chapter are all located in the ocean areas where the rises will be greatest (IPCC 2013, p. 1195; Nurse et al. 2014).

There is also the possibility that the IPCC predictions are low, especially if one considers recent studies about the collapse of Antarctica's ice sheets and of glaciers melting faster than predicted. These phenomena could lead to a sea-level rise of more than 3 metres (Joughin et al. 2014; Rignot et al. 2014). Other studies have also shown that IPCC predictions could be low. Researchers gathered the opinions of 90 sea-level experts and concluded that the rise could be in the order of 0.7–1.2 m by 2100 and 2–3 m by 2300. This would jeopardize the survival of many coastal cities and low-lying island states (Horton et al. 2014). However, it is not only rising sea levels but also coastal erosion, high tides, worsening floods, cyclones, and ocean acidification that threaten the coastal areas (IPCC 2013).

A large proportion of the world's population lives on coastlines and many coastal megacities are at risk (Adamo 2010). Of the coastal countries, the Netherlands, Bahrain, Azerbaijan, Denmark, and Vietnam have the largest land area with an elevation less than 5 m above sea level in proportion to the country's total land area. According to data from the World Bank,[1] these countries have respectively 59, 39, 20, 18, and 18 % of their total land area with an elevation less than 5 m. While this is substantial, it is still impossible for them to be submerged by the end of this century. A study by Dasgupta et al. (2009) looks at the coastal vulnerability of 84 developed countries and the effects of rising sea levels. If there is a one metre rise, the worst hit coastal countries would be Vietnam (approximately 5 % of land area affected), Qatar (less than 3 %), Belize, The Gambia, and Bangladesh (where less than 2 % of land area would be submerged). On that basis, where a risk of complete submersion exists, it applies only to island countries at which we will now take a closer look.

[1] http://data.worldbank.org/indicator/AG.LND.EL5M.ZS.

11.3 Which States Are at Risk of Complete Submersion?

Three successive Assessment Reports of the IPCC note that small island states are among the most vulnerable to the effects of climate change. "Sea-level rise poses one of the most widely recognized climate-change threats to low-lying coastal areas. This is particularly important in small islands where the majority of human communities and infrastructure is located in coastal zones with limited on-island relocation opportunities especially on atoll islands" (Nurse et al. 2014, p. 5). A report mapping the effects of climate change on human migration projected that 40 small island states could be submerged by 2100 because of the global rise in sea level (Warner et al. 2009). "For countries made up entirely of low-lying atolls, sea-level rise, ocean acidification, and increases in episodes of extreme sea-surface temperatures, compromise human security for existing or larger numbers of people. With projected high levels of sea-level rise beyond the end of this century, the physical integrity of low-lying islands is under threat" (Adger et al. 2014, p. 20). Some islands are particularly vulnerable to rises in sea level (e.g., Tokelau, Niue) and some have already disappeared under water (e.g., Holland Island, New Moore/South Talpatti) or been evacuated (e.g., Carteret Islands). However, none of these islands are sovereign nations: Tokelau is a territory of New Zealand, Niue is a self-governing state in free association with New Zealand (Niueans are New Zealand citizens), Holland Island is part of the U.S., New Moore/South Talpatti is administered by India and claimed by Bangladesh, and Carteret atoll is part of Papua New Guinea. While these cases are important, they have not led to statelessness.

The purpose of this section is to determine which countries could disappear in the coming decades, leading to a new form of statelessness. Using the maximum elevation of countries, Piguet (2012) conducted a comprehensive review of countries' risks and drew up a preliminary list of threatened states—all of which were among the Association of Small Island States (AOSIS). With updated sources of data on maximum elevation and population, there are six independent island states that have a maximum elevation of less than 100 m (see Table 11.1).

Table 11.1 Island states with maximum elevation < 100 m

Countries	Highest point (m)	Population
Maldives	2.4	393,595
Tuvalu	4.6	10,782
Marshall Islands	10	70,983
Bahamas	63	321,834
Nauru	65	9,488
Kiribati	81	104,488

https://www.cia.gov/library/publications/the-world-factbook/geos/mv.html
http://en.wikipedia.org/wiki/Niulakita
http://www.peakbagger.com/https://www.cia.gov/library/publications/the-world-factbook/

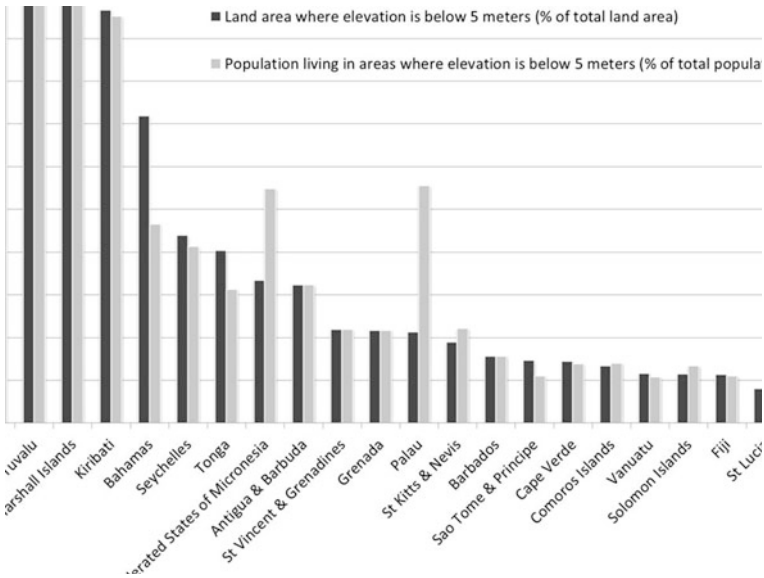

Fig. 11.1 Land area and population at risk in small island states http://data.worldbank.org/indicator/AG.LND.EL5M.ZS and http://data.worldbank.org/indicator/EN.POP.EL5M.ZS/countries

Going one step further, we cross-referenced data from the World Bank. Figure 11.1 shows that, while many island countries have low percentages of land area with elevations less than 5 m and low percentages of population living in these areas, the Maldives, Tuvalu, the Marshall Islands, and Kiribati have higher percentages on both counts. Indeed, the entire land area of the Maldives and Tuvalu is less than 5 m in elevation and thus 100 % of the population lives in areas with an elevation less than 5 m. The figures for the Marshall Islands are 99 % for land area below 5 m and for population living in areas with an elevation under 5 m. Kiribati's figures are 97 and 95 %, respectively. The fifth country on the list is the Bahamas, which has lower percentages of 72 and 47 % respectively. According to Piguet (2012), the topography of the Bahamas and their economic wealth make their disappearance unlikely.

The sea level could rise two metres by 2100 if global air temperatures rise 4 °C or more (McLeman 2013). This means that countries such as the Maldives and Tuvalu would almost entirely disappear under water. Indeed, having as its highest point a dune 2.4 m above sea level at an unnamed location on Villingili Island on Addu atoll, the Maldives might have most of its territory submerged. Nevertheless, the island city and capital Malé should endure thanks to 3.5-m-high sea walls,

financed by Japan. The population density of Malé per square kilometre is high—the country is the 7th densest of the world's independent countries, and Malé atoll is the 4th most densely populated island in the world.[2] The situation in Tuvalu, a country of three reef islands and six atolls and a land area of only 26 km^2, might be even worse because they have no protective dikes. Tuvalu's highest point is on the uninhabited island of Niukalita, and all other atolls are low lying. The Marshall Islands have a maximum elevation point of 10 m. This is on Likiep atoll, home to a few hundred people. The mean altitude of all atolls in the Marshall Islands is 2.1 m above sea level. Two thirds of the population lives on Ebeye and Majuro islands, Ebeye being the 5th most densely populated island in the world.[3]We also considered Nauru and Kiribati in our list of at-risk countries because, even though they have higher maximum elevation points, these points are located in inhospitable places. Indeed, a large percentage of Nauruans live on the coastal perimeter at low altitudes and cannot move to the higher plateau, which is uninhabitable because of phosphate mining.[4] Kiribati is a country made up of widely scattered islands and atolls and is the only country in the world that lies in all four hemispheres—north, south, east and west.[5] It is composed of 32 atolls and a solitary coral island, Banaba. This island is the location of the country's highest elevation point and where a few hundred people live. The rest of the Kiribati residents live in the country's lower areas. In the past, Banaba Island, like Nauru, was a site of phosphate mining which forced some residents to relocate to Fiji (Edwards 2013).

Our assessment of places in the world where the impacts of climate change could lead to a new form of statelessness reveals that only five countries are threatened with complete submersion or with becoming uninhabitable. It must be recognized that some low-lying islands could become uninhabitable before they are completely submerged (Julca and Paddison 2010). This is a limited phenomenon that might affect about 600,000 people in the Indian Ocean and Pacific Ocean. Nevertheless, it requires careful attention, and intelligent planning and strategies. It also raises several legal issues: "…the retreat of coastlines as a result of the submergence of low-lying areas, small islands and atolls, as well as coastal erosion, could significantly alter the reference line for the determination of a coastal state's legal zones in the ocean, termed the baseline" (Houghton et al. 2010). Now that we have assessed which countries could potentially disappear, we will discuss the legal implications that flow from this issue and the possible solutions.

[2]http://gadling.com/2011/07/07/top-ten-most-crowded-islands-in-the-world/?icid=main|htmlws-main-n|dl8|sec1_lnk3|218442.

[3]http://gadling.com/2011/07/07/top-ten-most-crowded-islands-in-the-world/?icid=main|htmlws-main-n|dl8|sec1_lnk3|218442.

[4]http://unfccc.int/resource/docs/natc/naunc1.pdf.

[5]http://www.eoearth.org/view/article/172199/.

11.4 Legal Implications: A New Form of Environmentally Related Statelessness?

The debate about the new form of statelessness resulting from *disappearing* countries raises many issues. There are the institutional issues—with the disappearance of territories, the institutions of a modern state will disappear. And there are the human issues—with increased human mobility, there will be a need for their protection and support. The Pacific island states are focusing on the legal frameworks and policies that could be developed to mitigate the threat of climate-change-related statelessness. These frameworks require clarification under international law and human rights law. To this end this chapter seeks to explore legal means for dealing with populations displaced as a result of the adverse impacts of climate change that are consistent with states' existing international legal obligations. Finally, addressing the question of statelessness, this chapter aims to offer new insights related to the studies on the impacts of climate change on vulnerable states. The focus is on the legal instruments available, in particular at the national and regional level, to recognize and protect those who have migrated or who will be forced to leave their homes.

11.5 Human Rights Implications for Population of Small Islands Nations at Risk of Becoming Stateless

In 2004, the UN Human Rights Council (formerly the UN Commission on Human Rights) addressed the situation of small island states in danger of vanishing completely by adopting the working paper *The Human Rights Situation of Indigenous Peoples in States and Territories Threatened with Extinction for Environmental Reasons* which states: "Whilst members of the UN…are used to addressing issues of State succession, it would appear that the extinction of a state, without there being a successor, is unprecedented …" (CHR 2004, para. 6).

The notion of state extinction requires reference to the criteria for the identification of the modern concept of the state. According to traditional understanding, statehood is determined by the following requirements: territory, population, government, and the ability to enter into relations with other states (Park 2011; Crawford 2006). The current debate is about whether changes affecting one of these basic criteria will automatically result in the state's extinction (Gagain 2012; Raestad 1939).

The historical development of the concept of state extinction shows that the disappearance of one of the *so-called elements* of statehood is relevant to the assessment of the existence (or not) of a state. However, it remains an open question under international law "…whether the loss of state's entire land mass due to rising

sea level means the entity ceases to be a state" (Gagain 2012). The possibility of a state being submerged has been examined by Marek, who argued that only if the "…loss of territory is either total or very considerable…" could this exception affect the identity and continuity of the state (Marek 1954). This analysis has been criticized as unhelpful. It is generally acknowledged that there is a lacuna in international law in this regard, and the situation, in which small island states find themselves, is unprecedented (Jain 2014; Wong 2014). To address this legal grey area, the modern doctrine is more oriented toward a presumption "…against the extinction of states once firmly established" (Crawford 2006; Wong 2014). The UN Charter endorses the assumption of the continuity of states and identifies the extinction of a state as an exception in international law. This aspect of the international legal system leads to a situation in which the extinction of a state may arise only in *exceptional circumstances* (Park 2011).

Recently, it is has been argued that the physical disappearance of a state could be a new form of statehood of *de-territorialized entities* (Rayfuse 2009a, b) or of *nations ex situ* (Burkett 2011). From this perspective, de-territorialized states could exist and would have a diffuse population with a government located anywhere in the world (Rayfuse 2009a, b; Burkett 2011). In this case, international law would have to recognize *de jure* statehood even if the states have ceased to exist as de facto states (Jain 2014; Rayfuse 2009a, b).

What is crucial to this debate, however, is the legal status accorded to the affected population. The main risk is that members of the population could be deprived of their nationality and all related rights. The deprivation of citizenship raises serious concerns in terms of the enjoyment of civil, political, and economic rights (e.g., the right to diplomatic protection, the right to stay, to enter and to return).

The legal definition of statelessness in international law, according to of the *Convention Relating to the Status of Stateless Persons* (article 1, 1954), is "…a person who is not considered as a national by state under the operation of its law." Some scholars adopt a broad definition including *de jure* (as described above) and *de facto* stateless persons (e.g., the case of an individual having a nationality but unable to enjoy the protection of a government). In addition, statelessness may be absolute (at birth) or relative (if a person has lost his or her nationality), and the situation may be one of individual or mass statelessness. This last situation is most relevant to this analysis, in fact cases of mass statelessness may be related to territorial changes or state practices (McAdam 2012).

In this context, the United Nations has made several efforts to reduce statelessness. Article 15 of the Universal Declaration of Human Rights states that "everyone has the right to a nationality" and "no one shall be arbitrarily deprived of his nationality." In 1954, the Protocol on Stateless Persons, drafted as an addendum to the 1951 *Refugee Convention*, became a convention (1954 *Convention on the Status of Stateless Persons*), which makes a clear distinction between *de facto* and

de jure statelessness. Furthermore, the United Nations General Assembly adopted the *Convention on the Reduction of Statelessness* in 1961, which entered into force in 1975 and was ratified by only a few states. According to this Convention, the UN High Commissioner for Refugees is responsible for guaranteeing international protection of individuals claiming the rights of the Conventions (UN Resolution 3274 XXIX and Resolution 31/36).

Other international instruments deal with the protection of the right to nationality. These include articles 24 and 26 of the *International Covenant on Civil and Political Rights* (ICCPR), article 9 of the *Convention on the Elimination of All Forms of Discrimination against Women* (CEDAW), and the *Draft Articles on Nationality of Natural Persons in Relation to the Succession of States*. This last document, adopted by the International Law Commission (ILC) in 1999, expressly affirms the duty of states to prevent statelessness in the context of state succession.

Although there are several international instruments in place to prevent the risk of denationalization, international law still indicates that states have the discretion to establish the conditions to acquire and lose citizenship. Binding instruments have been ratified by only a few states, and other instruments lack implementation. It would be interesting to consider the option of allowing dual citizenship and safeguarding the cultural ties to countries of origin (Nansen Initiative 2013).

Even if statehood formally continues and members of the affected population are able to keep their nationality, some key issues and protection concerns remain. These issues were highlighted by the *Report of the Nansen Initiative Pacific Regional Consultation* "…to encourage review, as part of regional processes, of existing admission and immigration policies […] to ensure the full respect of the human rights of people admitted in the context of voluntary migration, forced displacement and planned relocation; ratify and implement relevant international human rights instruments" (Nansen Initiative 2013).

As recently reported by the Special Rapporteur on the Human Rights of Migrants (SRHRM), the population of these at-risk islands may not have an adequate standard of living, or the right to water and a healthy environment. Adaptation measures need to be adopted by both the states-of-origin and the states-of-destination (SRHRM 2012). For example, the 2007 National Adaptation Programme of Action adopted by Kiribati under the *United Nations Framework Convention on Climate Change* clearly illustrates a "general deterioration in the state of health of the population" (e.g., increasing cases of fish poisoning and diarrhea) as a direct result of sea-level rise (Immigration and Protection Tribunal New Zealand 2013, NZIPT 800413 [para. 10–11]). As noted by the Immigration and Protection Tribunal of New Zealand, the exposure of island populations to natural hazards in the context of climate change has already had an effect on basic human rights (e.g., destruction of personal and community property, increasing salinity of fresh water) and the situation will only get worse (e.g., increase in dengue fever, increase in human stress) (AD (Tuvalu) 2014, NZIPT 501370-371).

11.6 Evolution of State Practices Developed by Low-Lying Island States

Numerous endeavours are being made to cope with the risks of statelessness using a twofold approach: there are the efforts to prevent the situation of statelessness by allowing citizens to maintain their nationality and remain in their homes; and there are the attempts to improve the situation of potentially stateless persons by developing and improving migration options available at bilateral and regional levels.

11.6.1 Overview of Adaptation Measures

Adaptation measures are those strategies which address the immediate effects of environmental degradation. These measures can be long term or they can be temporary such as building sea walls (e.g., Great Wall of Malé) or reinforcing coastlines. Some states, such as the Maldives and Kiribati, are looking at longer-term initiatives to retain their sovereignty and rights as a state. The president of Kiribati has recently bought land on Vanua Levu (Caramel 2014). The Maldives have opted to build an artificial island (Hulhumale) to overcome their potential loss of statehood and maritime zones. However, the legal status of this artificial island remains unclear (Gagain 2012). Gagain has made the point that such islands cannot be considered states according to the *UN Convention on the Law of the Sea*. This instrument seems to exclude artificial islands from the definition of an island, namely land "naturally formed" (art. 121 United Nations Conven*tion on the Law of the Sea*—LOSC). Under international law, there is a general right to construct artificial islands, but it is not possible "to endorse them as 'defined territory'" so as not to generate maritime zones (Gagain 2012). As suggested by Gagain, this solution would require amending the LOSC to expand the legal status of artificial islands as a viable solution to preserve statehood and to perpetuate maritime claims (Gagain 2012).

Even if a legal solution, such an amendment in the LOSC, could be identified, there remain some significant challenges. For example, the financial costs involved with most adaptive measures are prohibitive and many of the affected countries lack sufficient capacity, having poor infrastructures and scarce financial resources. It is in this context that a lively debate has emerged about responsibilities and compensations. As part of the Cancun Adaptation Framework, parties looked at ways to address loss and damage associated with climate-change impacts in vulnerable countries. After two years of deliberation on this issue, COP19 (November 2013) established the *Warsaw International Mechanism for Loss and Damage associated with Climate-Change Impacts* as the main vehicle under the Convention (See

decision 2/CP.19).[6] We acknowledge the importance of such mechanisms but wish to explore other complementary avenues linking migration and climate change adaptation.

11.6.2 Migration Strategies to Reduce Vulnerability

Threatened small island states, often referred to as sinking islands, are aware that they have a role to play in the emerging discourse on the normative implications that environmental factors have for contemporary rule making and for the structures of migration governance (Kaelin and Schrepfer 2012; Nansen Initiative 2013).

As highlighted by the Nansen Initiative, the Pacific region has a "long history of mobility" and there is a high degree of "support provided to people through existing clan and kinship networks" that could support the cross-border relocation of these communities if needed as a last resort (Nansen Initiative 2013). Farkboto notes that citizens of small Pacific islands have a "…cultural identity as great travellers, inheritors of their ancestors' remarkable achievements in navigating, sailing and settling throughout islands of the expansive Pacific Ocean" (Farkboto 2010 [p. 54]). According to studies, in 2010 around 850,000 migrants from Pacific small island states emigrated to New Zealand (350,000), the U.S. (300,000), Australia (150,000), and Canada (50,000) (Bedford and Graeme 2012).

Migration is a different strategy from previous measures undertaken. The implementation of different migration schemes may play a role in preventing forced displacement and in promoting voluntary movements from at-risk areas (Thornton 2011). The current focus is on exploring the risks associated with existing migration provisions. As stated by Castles, "…the objective of public policy should not be to prevent migration, but rather to ensure that it can take place in appropriate ways and under safety, security and legality" (Castles 2010 [245]). Contemporary patterns of migration, which are different at the national, regional, and international level, can be identified as responses to some of the protection needs and challenges of human mobility in the context of environmental changes (Tabucanon 2012).

The migratory profiles of these islands are heavily influenced by their historical background and the "remnants of colonialism" (Tabucanon 2012). They offer an opportunity to compare how different migratory strategies are evolving (at the bilateral and regional level) and the impact of formal and informal cooperation to overcome potential asymmetries in facilitating legal mobility. Eberhard has emphasized that migration strategies have traditionally been widely used by the citizens of low-lying states and their movements are clearly established by the economic interest of the countries of destination, mainly ex-colonial powers

[6] http://unfccc.int/resource/docs/2013/cop19/eng/10a01.pdf.

(Eberhard 2012). The agreements in place, as described later, reflect a market-based approach and mobility is strictly regulated by the immigration provisions of countries of destination. It might be that some people affected by environmental changes could migrate to states with which their countries have specific ties, whereas other people might not have this option and they risk being stranded in their home country (Nansen Initiative 2013).

There is a need to further explore the potential impacts of these measures as well as the significant human rights implications regarding mobility in the countries of destination (e.g., right to stay, right to return, right to health, right to housing) (Kaelin and Schrepfer 2012). More than statelessness, the contemporary debate must focus on specific challenges related to facilitating the legal admission of citizens of these submerged island states and how to secure their rights in the country of admission (Tabucanon 2012). In this context, the case of the disappearing states will join the more general discussion of whether or not there is a need for a new legal framework (Wyman 2013) as a promising opportunity for identifying how to assist and protect the affected population.

11.6.3 Bilateral Labour Schemes as a Normative Framework to Facilitate Environmentally Induced Migration

Destination countries do not have comprehensive instruments to recognize environmental changes as a legitimate reason to grant a permit for a migrant to stay. A few provisions are in place with limited options for specific cases, and these mechanisms are generally oriented to dealing with the immediate aftermath of a disaster. For example, the government of Australia adopted a specific "humanitarian stay visa (subclass 449) designed to respond to short-term humanitarian crises, and visa holders are expected to return home when the Australian Government considers it safe to do so" (Nansen Initiative 2013). Since 1990, the United States has also provided a Temporary Protected Status (TPS) for persons in need of protection as part of their immigration regimes (Tubacanon 2012). Protection is granted to people who are "temporarily unable to safely return to their home country because of ongoing armed conflict, an environmental disaster, or other extraordinary and temporary conditions." This applies only to those who are already in the United States when the TPS is granted and is only a short-term solution (Wyman 2013). In most cases, these instruments are discretionary in nature providing only temporary protection and permanent migration options are not available (Messick and Bergeron 2014; Dema 2012).

There was a recent decision, adopted by the Immigration and Protection Tribunal of New Zealand, to grant residence visas on humanitarian grounds to the citizens of

Tuvalu who claimed to be at risk of suffering adverse effects of climate change and socio-economic deprivation if deported to Tuvalu [AD (Tuvalu) (2014) NZIPT 501370-371]. This is a significant case because the tribunal explored whether the exposure to the impacts of climate change and environmental degradation could be retained as a "humanitarian circumstance" that "would make it unjust or unduly harsh for the appellant to be removed from New Zealand" (Ibid., para. 18). In its conclusion, the tribunal found exceptional circumstances of a humanitarian nature based on the dense family and community network (Ibid., para. 31) and it didn't reach a conclusion on the climate change claim (Ibid., para. 33). In its reasoning, the tribunal noted that, "…as for the climate change issue relied on so heavily, while the Tribunal accepts that exposure to the impacts of natural disasters can, in general terms, be a humanitarian circumstance, nevertheless the evidence in appeals such as these must establish not simply the existence of a matter of broad humanitarian concern, but that there are exceptional circumstances of a humanitarian nature such that it would be unjust or unduly harsh to deport the particular appellant from New Zealand" (Ibid., para. 32). While the tribunal acknowledged that current and future impacts of environmental degradation "can constitute a circumstance of a humanitarian nature" (Ibid., para. 27), it didn't to establish its decision on these grounds. Nevertheless, this case has stimulated an innovative and revolutionary debate that may allow the regularization of the immigration status of people affected by environmental degradation in future decisions.

Within the framework of push and pull dynamics, countries significantly affected by environmental changes are elaborating mobility schemes to enhance the ability of people to move and, to some degree, to support growth in human capital investment (e.g., education) and entrepreneurial development—both of which would increase freedom of choice and productivity (Hess 2006).

The Republic of Kiribati frames the environmental-mobility nexus as a supranational issue connecting all negotiation processes with the broad debate on climate-change adaptation (Sward and Codjoe 2012). The government of Kiribati has created education and training programmes so that people can contribute to the economy of their potential country of destination (Maas and Carius 2011). They have also developed strategies, such as Migration with Dignity, to promote migration as an adaptation strategy. In fact, the president of Kiribati is encouraging citizens to migrate now, before they are forced to leave. The aim is to encourage migratory flows to Australia and New Zealand where migrants can get high-level skilled jobs.

It is important to recall that Kiribati has strong links to Australia and New Zealand due to the British Phosphate Commission's mining of phosphate deposits in these countries during the 20th century. This relationship has influenced the development and adoption of Kiribati's mobility schemes (Bedford and Graeme 2012). At present, Kiribati is involved in several migration programmes. One such programme is the Pacific Seasonal Workers Pilot Scheme (PSWPS) promoted by Australia in 2008 to encourage seasonal workers to assist Australian employers in

the horticultural industry (World Bank 2014). According to this agreement, 2500 visas were made available over a period of three years for citizens of Kiribati, Papua New Guinea and Vanuatu. In 2007, New Zealand launched the Recognized Seasonal Employer Scheme that allowed up to 8000 overseas workers (from Kiribati, Samoa, Tonga, Tuvalu, the Marshall Islands, and Palau) to enter New Zealand for seven months in any 11-month period to work in the horticulture and viticulture industries (Thornton 2011). Another arrangement, the Pacific Access Category, reserves a special quota for citizens from Kiribati (including partners and children) to encourage permanent labour mobility to New Zealand (World Bank 2014; Thornton 2011). And in 2011, the United States adopted the Pacific Seasonal Worker Scheme that allows citizens of small Pacific islands to fill temporary or seasonal jobs in the U.S. (Tubacanon 2012).

A specific concern is the need for—but at the same time, the difficulty of—activating mobility schemes that are already in place. Evaluations to date have focused on the formidable obstacles to implementing temporary mobility schemes in the Pacific, particularly the Australian schemes (McKenzie and Gibson 2011; McKenzie 2010). A comprehensive analysis conducted by Hay and Howes identified several constraints linked to the poor implementation of these agreements. These include the absence of labour shortages in targeted sectors of agriculture and horticulture; the lack of information about the scheme; and the significant level of risk (e.g., risk of absconding) and cost (e.g., transaction costs) (Hay and Howes 2012; World Bank 2014).

An additional point highlighted by Oxfam is that "these schemes are unilaterally offered, and so can be modified or withdrawn at any time" (Oxfam 2009). The main risk is that seasonal work schemes do not adhere to core labour conventions and human rights standards. In particular, the *International Labour Organization (ILO) Conventions* specifically aimed at protecting migrant workers—Convention No. 97 (1949) and Convention No. 143 (1975)—and the *UN Migrant Workers Convention* (UNMWC) of 18 December 1990 have not been ratified by the Australian and Kiribati governments. Both the states-of-origin and states-of-destination engaging in bilateral migration schemes have to guarantee that these instruments respect the human rights of potential migrants. Most negotiations of bilateral initiatives avoid including specific provisions on the treatment of migrant workers in terms of social security and health-care rights. (ACP Observatory Migration 2012).

Other countries, particularly the Micronesian countries such as the Republic of the Marshall Islands (RMI), are strongly linked to the United States (Bedford and Graeme 2012). This may lead to a uni-directional mobility flow that might exacerbate the vulnerable situation of migrants due to the lack of reciprocity between the country of origin and the country of destination.

Citizens from the Marshall Islands, according to the Compact of Free Association Marshallese (which includes citizens of Palau and Micronesia), have the right to live and work in the United States without a visa as non-immigrants…

but they do not have an automatic right to citizenship (Larson 1999–2000; Wyman 2013). In return, the government of the United States provides island states with specific kinds of economic assistance in exchange for full defence authority, which may affect the migration options available (Dema 2012). In fact, it has been reported that many migrants are at risk of becoming irregular migrants, thus subject to exploitation and unfavourable working conditions in the country of destination (Choo 2012).

In 2003, the government of the Marshall Islands amended the Compact of Free Association with the government of the U.S. RMI citizens are now no longer eligible for most non-emergency health care, and some states are suggesting health screening before migrants from RMI are allowed to enter the United States (Dema 2012). The 2003 amendments also added a strict immigration provision that allows the U.S. to unilaterally limit the length of time RMI citizens can stay (Dema 2012). This provision could, at any time, deprive RMI citizens of their rights and they could be deported at the discretion of the U.S. government "if the unilateral termination occurs" (Dema 2012).

11.7 Emerging Mobility Strategies: The Promising Role of Regional Regimes

As we have noted, there has been much progress made in understanding the complex and multi-causal process of migration related to climate change. However, to date there has been scant study into normative and institutional frameworks to investigate how existing legal rules, in particular the trade-in-services negotiation process and labour mobility, can be applied or used to meet the challenges of human mobility as a result of environmental changes. It is not well known that, at a regional level, island states are trying to increase the ability of people to move by negotiating a variety of trade agreements.

In August 2010, the Pacific Forum Island Countries developed the Temporary Movement of Natural Persons (TMNP) programme to be included in the Pacific Island Countries Trade Agreements (PICTA). This allows increased movement of labour and skills-transfer in the region as a key part of the trade-in-services arrangements (PIDC 2010; ACP Observatory of Migration 2012). This scheme is particularly important to address some of the labour-mobility needs in the region. It could also be used to develop a regional framework for increased mobility to remove existing barriers to free movement and to respond to the effects of environmental changes. While this model can facilitate the temporary mobility of skilled migrants, it does not include the option of permanent residence. In addition, this scheme requires that an active role be played by both the country of origin and the country of destination, and many countries of origin have no provisions to deal with skilled labour mobility.

The negotiations for the adoption of the Pacific Agreement on Closer Economic Relations (PACER-Plus) between the Pacific Island Countries and Australia and New Zealand may provide a starting point for responding to migration induced by environmental changes in the Pacific. The best arrangements for the Pacific islands will need to include temporary labour-mobility provisions to grant access not only to skilled migrants but also to unskilled workers. According to the Office of the Chief Trade Adviser (OCTA): "It was argued that due to the economic differences between the parties and the fact that FICs (Forum Island Countries) stood to gain very little, if at all, from their liberalization commitments in trade in goods, services and investment, PACER-Plus had to contain substantive commitments on labour mobility and development assistance" (OCTA 2014).

Despite the progress made so far, the inclusion of labour-mobility provisions in the negotiation process has been slow, and important concerns still need to be addressed "…namely the legal status of commitments on labour mobility, the removal of the caps or a significant increase in the number of workers allowed each year under the RSE and SWP and the extension of the schemes to other sectors of interest to the FICs, including health care and construction" (OCTA 2014).

11.8 Conclusion

Even if the danger remains marginal because so few island states are under threat of complete submersion, the scenario discussed in this chapter offers a unique opportunity to identify how to assist and protect populations affected by environmental changes. This brief analysis has identified two legal gaps concerning the rights of citizens of disappearing low-lying islands: the risk that statehood will not continue to be recognized at the international level and the legal implications for the affected population if a new form of statelessness becomes a fact; and the lack of consistent bilateral migration schemes that grant individuals (or groups of individuals) the right to enter and to stay in another state in the case of environmental degradation.

Presenting migration as the inevitable and only possible solution could compromise local adaptation strategies. Migration options are not a comprehensive solution for all citizens of at-risk small islands states. Local populations are not necessarily willing to migrate, preferring adaptation strategies to secure their islands and receiving aid to strengthen these measures. Our preliminary outline of the emerging adaptation measures found a high level of legal uncertainty, and we are not confident that these instruments are suitable to enhance the adaptive capacity of these at-risk Pacific islands.

Our analysis of migration arrangements in place at the bilateral and regional levels has tried to deepen the understanding of these schemes in the context of environmental changes. As currently developed, these instruments may be not

adequate to provide effective responses to the challenges highlighted. We can see that they are mainly market-oriented, guarantee only temporary solutions, and may be insufficient to deal with large-scale migratory flows from vulnerable countries.

Even if seasonal-worker schemes are important instruments to increase mobility opportunities for people in the Pacific vulnerable to environmental changes, the priority for small island states is to develop national and bilateral migration policies, through which seasonal programs may lead to more permanent solutions based on clear rules. Another priority is to ensure that existing schemes guarantee that both countries of origin and of destination will secure and implement the human rights of migrants and will make provisions to reduce the vulnerability of these people.

Against this background, the PACER-Plus, together with the TMNP protocol, may provide a promising regional framework for extending a legislative response to the challenges of environmental migration. The emphasis of the debate could be on assisting small island states with increasing and diversifying their migration patterns by adjusting to the needs of both affected countries and receiving countries.

Finally, our analysis identifies the need for legal research that conceptualizes how human mobility can be linked with other policy objectives related to climate change adaptation and sustainable development. This would hopefully lead to comprehensive policy strategies and effective protective responses to climate degradation.

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Chapter 12
The Arbitrary Project of Protecting Environmental Migrants

Benoît Mayer

Abstract The literature of environmental migration is divided. Some authors call for the protection of environmental migrants. Others argue that the concept is arbitrary and protection should be extended to all forced migrants. This chapter identifies three narratives: the rights narrative, the responsibility narrative, and the security narrative. I argue that none of these narratives justifies the implementation of a new governance mechanism for environmental migrants, who are not distinctively more vulnerable than other categories of migrants or non-migrants. Yet, this chapter also shows that virtually nothing in the contemporary governance of migration is based on systematic rational arguments. For example, the nexus requirement in the conventional definition of a refugee excludes many from the protection they need. This shows that the international governance of migration is largely framed by what states perceive as their own interests rather than by ethical considerations. Despite the arbitrariness, the concepts of environmental migration and climate migration could generate change because they attract significant attention. Other challenges are related to the definitions of migrant categories in need of protection—recognizing that states would prefer a narrow definition of environmental migrant. Essentially, protection of environmental migrants must be viewed as a first step toward the protection of the most vulnerable and must contribute to developing the capacities of the states most impacted by environmental degradation.

Keywords Environmental migration · Political dimensions of migration · International governance of migration · Norm entrepreneurship

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12.1 Introduction

Although significant attention has been paid to environmental migration and specific governance proposals have been developed, there appears to be no valid reason to view environmental migration as a phenomenon most in need of reformed international governance. The vulnerability of migrants is not related to the cause of departure as much as to the circumstances of the journey and the reception in the receiving community. Among the persons affected by environmental phenomena, those who are able to choose to migrate—those with the necessary economic and social resources—may be assumed to be better off than those who are unable to migrate. It therefore follows that environmental migrants are not necessarily more vulnerable than non-environmental migrants, and they are actually better able to adapt than environmental non-migrants.

The above noted observations raise a number of questions: Why do some situations of human suffering attract more attention than others? Why has political momentum built in support of the specific protection of environmental migrants or climate migrants, rather than other categories of equally or more vulnerable individuals? And what can be done about it?

In this chapter, I will reflect on the baseless distinctions that the protection of environmental migrants suggests. The discussion is organized into three sections. The first section highlights the arbitrariness of the initiatives to protect environmental migrants. The second section recognizes that other concepts and in fact most of the international governance of migration is based on moral arguments. And the final section weighs the pros and cons of a specific governance of environmental migration.

12.2 The Arbitrariness of Projects to Protect Environmental Migrants

Three narratives have been suggested to justify the protection of environmental migrants or climate migrants. These narratives relate to the protection of human rights (rights narrative), to the responsibility of some states for excessive greenhouse gas emissions causing global environmental change (responsibility narrative), and to the security dimensions of environmental changes and migration (security narrative) (Mayer 2012). Each of these narratives is rooted in a different discipline and leads to a different justification for an engagement of the international community. However, none of them is specific to environmental migration or able to offer a consistent justification for a specific governance endeavour.

The rights narrative relates to the broader humanitarian discourse and views the governance of environmental migration as essentially a question of international solidarity (e.g., McAdam 2012). Arguments in favour of the protection of environmental migrants use the rights narrative (e.g., Bell 2004; Brindal 2007). Such

arguments often involve an analogy between refugees and environmental migrants. Some of these proposals expand the definition of a refugee to include environmental refugees or climate refugees (e.g., Biermann and Boas 2010). Other proposals reject such labels, but nonetheless use, explicitly or implicitly, the existing protection of refugees as a starting point for their analysis (e.g., Crideau 2008; Mayer 2011).

Yet, there is no clear reason to distinguish environmental migrants or climate migrants from other migrants in need of protection. The vulnerability of migrants has little if anything to do with the cause of migration. While denouncing the arbitrary definition of a refugee, many of the arguments based on the rights narrative only suggest a more inclusive, but equally arbitrary, protection be extended to environmental migrants. A coherent rights narrative should call for the protection of the human rights of all migrants including forced migrants, survival migrants (Betts 2013) or crisis migrants (Martin et al. 2014). Given the prevalence of internal migration in the aftermath of environmental phenomena, the rights narrative should not disregard the importance of the protection of internal migrants. Whether or not internal migration can be attributed to an environmental phenomenon is not relevant in terms of protection. The rights narrative may call for the protection of the right to migrate (especially in the case of forced migrants), but also, perhaps more importantly, for the protection of the rights of the migrants. International human rights law does not guarantee the right to enter a country other than that of origin. As such, international migrants (including those lacking proper documentation) have generally the same rights as citizens (Human Rights Committee 1986). However, in practice, both internal and international migrants are vulnerable to many forms of abuse.

The rights narrative should not be limited to migrants: it should be accorded to everyone, especially the most vulnerable. Empirical studies have found that migrants are not the most vulnerable in the aftermath of an environmental disaster. It is the poorer who lack the resources necessary to move (Black et al. 2013; Foresight 2011, p. 9) who are the most vulnerable. Why should the rights narrative focus on environmental migrants, when the most vulnerable cannot and do not relocate?

The responsibility narrative defines the special obligations resulting from the misconduct of states that harm other states specifically in the context of the impact of climate change. For example, the Global North is the source of the bulk of historical greenhouse gas emissions and continues to have significantly higher per capita emissions than the Global South.[1] However, the adverse impacts of climate change tend to affect the Global South more severely for a range of reasons. These include the poorer population's greater reliance on natural resources and lesser resilience. In addition, many Global South countries are exposed to extreme weather events (e.g., tropical storms).

[1]See the data on greenhouse gas emissions per country provided by the World Resources Institute's Climate Data Explorer at http://cait2.wri.org.

There are many different points of view on the legal, political, and moral arguments calling for the Global North to take responsibility for its excessive greenhouse gas emissions and the consequences thereof. Although many of these arguments have merit, they are not without multiple technical hurdles as seen in the arguments that Tuvalu or Palau once considered submitting to the International Court of Justice, or those presented to American courts by the inhabitants of the small Alaskan village of Kivalina (see Ielemia 2007; Kysar 2011). Ethical arguments also raise important questions, such as the difficulty of discounting past emissions and future costs, the acceptability of ignorance as an excuse, and the level of excusable emissions (e.g., Shue 1999; Caney 2005). But if these difficulties can be overcome, could the responsibility narrative justify the specific protection of environmental migrants?

The relevance of responsibility as a basis for international cooperation vis–à-vis migration has been recognized in the on-going work on loss and damage associated with the adverse impacts of climate change (UNFCCC, Decision 3/CP.18, 2012, para. 7(a)(vi)). Some of the damage caused by climate change might be reflected in, consist of, or follow from migration. Yet it is practically impossible to conceive responsibility between an individual greenhouse gas emitter and an individual harmed by climate change. Responsibility may only be conceived between states—that is, between a state to which excessive greenhouse gas emissions can be attributed and a state whose population is significantly affected. If a person harms their neighbour, they must compensate the neighbour but they do not have the right to decide how the neighbour copes with the harm done. Likewise, the responsibility of a state cannot justify its interference in the domestic affairs of the injured state. The reparation due by a state as a result of an international wrongful act normally consists of compensation—a financial transfer to the injured state (see ILC 2001, art. 30, 31). There is no provision for responsible states—or anyone else, such as international institutions where responsible states have a say—to impose specific obligations on injured states.[2] The principle of state sovereignty demands that injured states be free to decide how to respond to the impacts of climate change, while remaining bound by unspecified international law obligations such as those protecting the human rights of migrants. Imposing specific obligations on injured states would cause further damage to the sovereignty of states, instead of making reparation. There is also the particular risk that foreign or international funders could use the pretext of climate-change adaptation to promote their own political agendas—the management of international migration and the containment of migrants in the South—rather than the protection of individuals affected by climate change. While there is always a risk that a government may be unwilling to protect its population, this risk does not justify a systematic denial of the sovereignty of developing states.

[2]It is at most a recommended practice but not an obligation under international law for a state to transfer to the injured person any compensation obtained for the injury from the responsible state. See ILC Draft Articles on Diplomatic Protection, Official Records of the General Assembly, Sixty-first Session, Supplement No. 10 (A/61/10), 2006, art. 19(c).

The security narrative is a construct of military and intelligence research. Its approach to environmental or climate migration is based on analyses of the interests of powerful actors (generally states, but possibly corporations as well) rather than their ethical responsibilities. This narrative contends that states should act early to prevent political instability and should cooperate to avoid illegal migration and the concomitant exacerbation of issues such as drug or human trafficking, failing states and wars affecting international commercial interests, and terrorism (e.g., Söderblom 2008).[3] In other words, states should cooperate because it is in their well-understood best interests, defined mostly on utilitarian grounds. This narrative comes with the incentive to militarize and a tendency to reframe climate migration as a human security issue (e.g., Elliott 2010). Here again, the specific relevance of environmental or climate migration as a distinct issue is not clearly evident. When a state goes through a spiral of environmental, economic, political, and military issues culminating in a failure to protect its population, the contribution of climate change to this spiral is irrelevant in terms of international security. At most, by making such scenarios more likely, climate change calls for more attention to larger security issues. By exacerbating certain elements of migration, climate change increases the scale of previously existing problems.

The literature on environmental or climate migration raises awareness of bigger problems related to the international mechanisms of rights protection and responsibilities in the context of climate change or international security. However, through none of these narratives does environmental or climate migration appear as a distinct issue that calls for specific solutions.

12.3 Arbitrariness in Global Migration Governance

The protection of environmental migrants is not the first arbitrary project in international governance. A brief historical review shows that, with regard to the governance of migration, arbitrariness is the rule rather than the exception. For example, the protection of refugees first applied to only a few specific national groups. It became more systematic with the adoption of the 1951 UN Convention relating to the Status of Refugees. This treaty recognized specific protections, in particular the prohibition of expulsion or return (non-refoulement), to the benefit of refugees. However, refugees were narrowly defined as any persons who:

> as a result of events occurring before 1 January 1951 and owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country.

[3]The fifth assessment report of the Intergovernmental Panel on Climate Change deals with climate migration in a chapter on human security (Barnett et al. 2014; Sect. 12.4).

The condition of persecution was thus further restricted by a condition of a nexus with one of the five grounds recognized for persecution, which cannot be justified by any sensible moral argument. As a consequence, whether asylum could be granted to women persecuted solely on the basis of their gender, for instance, was not clear. In 1951, the state parties were also allowed to restrict this protection just to European refugees. The state representatives who negotiated this convention were certainly aware of the narrowness of the definition. In fact, the final act of the Conference expressed a *hope* that the Convention would "have value as an example exceeding its contractual scope and that all nations will be guided by it in granting so far as possible to persons in their territory as refugees and who would not be covered by the terms of the Convention, the treatment for which it provides." The 1967 Protocol relating to the Status of Refugees removed the temporal and geographical limitations of the definition of a refugee without further extending its material conditions.

This definition of a refugee was denounced by many as arbitrary and insufficient, and arguments were made for the protection of *economic refugees* (e.g., Harris 1993), *internal refugees* and *development refugees* (e.g., Cernea 1990), as well as *environmental refugees* and *climate refugees*. Complementary protection was developed domestically and regionally but not in any consistent way. Treaties were not implemented (1969 Convention Governing the Specific Aspects of Refugee Problems in Africa, see Betts 2013, p. 14), and EU institutions came up with an indecipherable condition of a "serious and *individual threat* to a civilian's life or person by reason of *indiscriminate violence* in situations of international or internal armed conflict,"[4] an ambiguous phrase that limited the scope of protection.[5] The concomitant development of international human rights law offered grounds for domestic and regional courts to preclude refoulement in individual circumstances where a person would face a direct and personal risk to his or her core rights. Courts were however reluctant to expand non-refoulement to individuals facing more diffuse (but not less severe) threats to their rights.[6]

Beyond refugees, the situation of individuals remaining in their home countries was largely ignored. This happened despite the growing awareness of the

[4]Directive 2011/95/EU of the European Parliament and of the Council of 13 December 2011 on Standards for the Qualification of Third-Country Nationals or Stateless Persons as Beneficiaries of International Protection, for a Uniform Status for Refugees or for Persons Eligible for Subsidiary Protection, and for the Content of the Protection Granted, art. 15.

[5]Out of 135,210 applications in 2013, the 28 EU member states accorded the Geneva Convention status to 14,785 persons, but the subsidiary protection status only to 5350 persons. Domestic legislation provided the ground for granting complementary protection to 4470 persons. Statistics of Eurostat (European Commission), http://epp.eurostat.ec.europa.eu (accessed on 17 July 2014).

[6]An interesting judgment in this regard was adopted by a Chamber of the European Court of Human Rights in D. v. the United Kingdom (case 30240/96, Merits and Just Satisfaction, 2 May 1997), where the expulsion of a terminally-ill patient was precluded, but only with a particular emphasis on individual circumstances.

invisibility of vulnerable individuals unable to move, in countries affected by armed conflicts or generalized violence (see Lubkemann 2008, describing these individuals as *displaced in place* because of the profound changes in their lifescape). The Guiding Principles on Internal Displacement, implemented at the regional level by the African Union Convention for the Protection and Assistance of Internally Displaced Persons in Africa (Kampala Convention) of 2009, clarified the obligations of states toward people forcibly displaced within their jurisdiction. Yet this was done without providing any assurance of systematic international assistance in cases of large internal displacements.

While forced migrants need to be granted asylum, all migrants need to be protected from violations of their human rights that may arise because of their specific social vulnerability as migrants. To date, however, the protection of migrants in international law remains fragmented, with many states opposing any recognition of the human rights of undocumented migrants. The 1990 UN Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (2003) remains the least ratified of all UN human rights conventions. This convention relates the protection of the rights of migrants to their economic function in the receiving community—as if the refugee's economic function is a determinant of the rights of an individual.[7] The 1985 Declaration on the Human Rights of Individuals who are not Nationals of the Country is one of few documents that proposes the general and unconditional protection of the human rights of migrants.

Many other examples of arbitrariness can be found in international relations, particularly with regard to the governance of migration.[8] States maintain almost absolute control in determining their international legal obligations. States steadfastly defend their sovereign right to determine who is allowed to enter or remain under their jurisdiction. Consequently, the international governance of migration is piecemeal and largely unsatisfactory.

The important point here is that arbitrary concepts, definitions, and practices do not arise by chance. They are the product of compromises between divergent national interests and idealistic arguments. The states negotiating the 1951 Refugee Convention perceived a common interest in regulating the situation of groups of refugees within their territories (Hathaway 1990) and, despite their reluctance to establish broad protection mechanisms, they were keen to frame their agreement using general moral principles. The well-intentioned language of this convention

[7]One could not conceive of a protection mechanism of other vulnerable categories (women, children, persons with disabilities, etc.) which would be limited to those who work and the members of their families. Tying the protection of migrants to their contribution to the economy in the society of destination is equally arbitrary. The putative contribution of a person to the economy of the receiving state may be a relevant consideration at the stage of granting the right to migrate or to remain within the country, but it should not be a condition for the protection of the rights of a migrant.

[8]For example, with regard to the exclusion of labour migration from the guiding principles on internal displacement see Koser (2011).

unintentionally supported the arguments for broader protection through complementary protection, the protection of internally displaced persons, and the protection of the human rights of migrants in general. At the same time, however, the recognition of the rights of refugees may also have contributed to the distinction between forced migrants and voluntary migrants. This distinction leads to the unfortunate dichotomy between deserving and undeserving migrants. This of course highlights the right of states to control international migration and, perhaps, suggests that they could treat voluntary migrants however they wish. Because arbitrary concepts are not self-fulfilling, they create a dynamic for change. This in turn may constitute the first step toward more consistent forms of protection for some groups just as it may confirm the exclusion of others.

12.4 Opportunities and Limits of the Project to Protect Environmental Migrants

Because of the arbitrariness of the project of protecting environmental migrants, some authors have suggested that it should be abandoned altogether (see Betts 2013; Nicholson 2014). Consistent arguments could be made for the protection of the human rights of migrants (rights narrative), for the responsibility of states that have generated excessive greenhouse gas emissions (responsibility narrative), and for increased attention to the security consequences of climate change on migration (security narrative). To date, it appears that these narratives have had little influence on international negotiations. The UN Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (1990) remains under-ratified, and first-world countries are still reluctant to admit their responsibility for greenhouse gas emissions (Mayer 2014a).

Nevertheless, arbitrary projects sometimes succeed. The arbitrariness of the project to protect environmental migrants may not be an impediment. More than internal consistency, what makes a political argument successful is its ability to connect to existing problems that decision-makers have identified and want to address (see Cohen et al. 1972; Kingdon 1995, p. 87). New norms are established in international law when skilful norm-entrepreneurs, supported by powerful organizational platforms, are able to persuade critical states that in turn may rally other states (Finnemore and Sikkink 1998). Persuasion does not flow from reason alone; political arguments often draw on emotions and common representations rather than solely on clinical analyses of ethical duties or state interests (Crawford 2009).

Despite its logical inconsistencies, the case for the governance of environmental migration appears to be a magical recipe for norm entrepreneurs. There is no reason why migrants should be afforded protection more than any other group of vulnerable people…but migrants attract more attention if only because of the fear that they may be approaching *us*. Nor is there any reason to focus on environmental migrants or climate migrants specifically…except anything related to climate

change attracts public attention and, possibly, engagement. By joining the deep-rooted fears of migration with the existential uncertainties elicited by climate change, the concepts of environmental migration or climate migration have immense *marketing* potential (Mayer 2014b).

However, there are significant hurdles with the protection of environmental migrants or climate migrants. For example, the project is disputed by norm entrepreneurs with very different agendas—humanitarian assistance, protection of the migrants, climate-change governance, international security. These norm entrepreneurs talk about the same concepts in entirely different terms. But the arguments with the greatest emotional power and the greatest ability to offer a simple and convenient solution will prevail (Mayer 2014b).

Another hurdle relates to the absence of a definition of environmental migrants beyond the very abstract notion of migrants *induced* to move by environmental phenomena. Multiple and complex proxy factors determine the impacts of a physical event on a society, including whether and how it results in migration—and the form of migration (organized or spontaneous, individual or collective, temporary or permanent, in better or worse conditions, etc.). Slow-onset environmental factors affect societies indirectly, particularly through economic channels. As a consequence, it appears that "it will rarely be possible to distinguish individuals for whom environmental factors are the sole driver (environmental migrants)" (Foresight 2011, p. 9). How can environmental migrants be protected, if they cannot be distinguished?

With these two considerations—the competition of norm entrepreneurs and the difficulty of distinguishing migrants to protect—it is possible that the advocates for the protection of migrants will be pushed to propose a very narrow definition of environmental migrants, which would form a convenient solution applicable in only a handful of cases where causation is clearly established. This definition may be limited to international migration, which represents only a tiny fraction of existing migration flows but constitutes a more direct concern for donor states. Western states may favour the protection of migrants in neighbouring countries as a way to confine migrants in the Global South, thus supporting regional cooperation with states of transit. Yet, international migration can rarely be directly connected to an environmental phenomenon—primarily because it follows from the economic consequences of slow-onset environmental changes rather than from sudden natural disasters, when migrants remain generally within the same country. The focus could therefore be on the case of small island developing states (with very small populations) as well as states that are highly affected by climate change (e.g., Bangladesh, Nigeria) and whose population could be tempted to migrate to Western states, or where particular security interests or threats (e.g., terrorism) are perceived to be at stake.

12.5 Conclusion

Social progress is rarely the product of fully reasoned ethical arguments. Instead, biased representation and emotions are factors that allow the success of certain arguments over others in public deliberation. The arbitrariness of the project of protecting environmental migrants is not a reason to abandon this project. The refugee label, based on an arbitrary definition, succeeded in the post-Second World War era because it expressed the protection of the individual's rights in the language of the enlightened self-interests of states (Hathaway 2005, p. 93). It was the first step toward broader international efforts in the protection of forced migrants.

In an ideal world, the rights of all migrants would be protected, and states (if they existed at all in an ideal world) would cooperate with a spirit of solidarity and responsibility. Yet, governance proposals regarding the protection of environmental migration take place in a more pragmatic world, where governments focus mainly on the interests of their constituency. In today's world, arguments for the specific protection of environmental migrants might be part of a strategy to achieve progress, even though they do not target those most in need of international attention. These protections must however be deployed and used cautiously, with constant consideration for the protection of the most vulnerable individuals and for the limited capacities of the states impacted by environmental degradation.

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Part V
Conclusions

Chapter 13
Conclusion: Inequality and Migration as Adaptation—Where Do We Go from Here?

Jeanette Schade, Thomas Faist and Robert McLeman

Abstract The chapters in this volume illustrate how the relationship between migration and adaptation is as complex and multilayered as is the relationship between migration and environmental change. In this concluding chapter, we summarize some of the key discussions about inequalities within the environmental migration debate and draw attention to issues such as the role of remittances and inequality within households. We reflect on the preceding chapters, focusing on how the contributing authors have traced and assessed the influence of inequalities on environmental migration in their empirical findings, methodological approaches, and policy discussions. We then compare these with recent theoretical and empirical developments in the broader migration literature. We also consider how social inequality is presently addressed in legal and policy instruments that address environmentally induced migration, and offer suggestions for future research and discussion.

Keywords Migration as adaptation · Remittances · New economics of labour migration · Legal frameworks · Social inequalities

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13.1 Introduction

Academic and policy discussions about the linkages between environment, climate, and migration have evolved considerably over the past twenty-five years, and today there is an increasingly sophisticated understanding of the issues. We no longer see the environmental change-migration nexus treated simply as an involuntary, forced response to exogenous stimuli. Instead, we see growing acknowledgement that migration decisions are the product of differentiated levels of capability at community, household, and individual levels. We see this evolution in IPCC reporting, where migration was once characterized as an involuntary, last-resort response to climate change (IPCC 2001, p. 397), was later qualified as a subject about which scientific consensus was lacking (IPCC 2007, p. 365), and is now described as an essential element of human security, playing a central role in adaptation more generally (IPCC 2014, p. 767). Current IPCC reporting reflects the efforts of scholars, governments, and international organizations to move beyond the alarmist discourses that once typified discussions of the subject. We now see a growing alignment with research on the migration-development nexus, where questions of capability, agency, gender, and similar factors have long been recognized as important considerations, and which particularly emphasizes the important albeit ambiguous impact of remittances (Faist 2008; Faist and Schade 2013).

A significant outcome of this evolution is the 180-degree change that has occurred in how the subject of migration in the context of climatic or environmental change is approached. Once seen as a *problem* to be feared and avoided, it is now discussed and promoted as a *solution* (Vlassopoulos 2013). This new policy discourse views migration as an *adaptation to environmental change*, whereas it was previously seen as *involuntary flight from environmental distress*. Further, *migration as adaptation* is frequently understood to include not only labour migration undertaken as a livelihood strategy by people exercising agency, but it also encompasses planned relocations that countries are encouraged to consider as a response strategy under the UNFCCC's Cancun Agreements (UNFCCC 2011, para. 14(f)). This approach has also been taken up by policy oriented research projects such as *Where the Rainfalls* and *Migration, Environment and Climate Change: Evidence for Policy* (MECLEP).[1] By embracing this new perspective of migration as an adaptation solution, care must be taken to recognize situations where migration curtails the capabilities of those exposed to environmental risks and thereby increases vulnerability and human insecurity. In sociological research, the commonly used analytical framework for addressing this challenge focuses on the effects of migration through the lens of social inequality in its material (resources)

[1]The first project was conducted under the lead of the United Nations University-Environmental and Human Security (UNU-EHS; wheretherainfalls.org/) and the second, ongoing one, is under the lead of the International Organization for Migration (IOM; https://www.iom.int/meclep).

and non-material aspects (such as status and power) (cf. Tilly 2009). Inequalities thereby figure both as part of the preconditions for environmental migration and as part of the outcomes. This raises important questions about the effects of migration on social inequalities—whether old inequalities are perpetuated in the course of migration, and whether new inequalities arise.

Given the inherent role of social inequalities in environmental migration processes, it is worth asking how optimistic we should be about migration as a form of adaptation. Any number of possible obstacles can prevent the adaptation benefits of migration from being realized (Schade 2013). Migration inevitably entails risks and trade-offs, and migrants may encounter serious—even life-threatening—difficulties on their journey or at their destinations. The act of migration will not in itself address the risks and inequalities migrants face with respect to guaranteeing their livelihood (or income), which shapes their social status within their community, and which maintains the power structures in the families and communities where decisions about migration and non-migration are made. Moreover, the risks attached to migration as an adaptation strategy extend beyond the individual migrant. Households in the place of origin may struggle to compensate for the lost contributions of the absent member. Desired remittances may not materialize. The departure of large numbers of out-migrants may have adverse impacts on the social fabric, the adaptive capacity, and the resilience of the communities left behind. Migrant receiving communities may struggle to absorb sudden and large numbers of new arrivals, causing resilience and adaptive capacity to decline. These are but a few of the many considerations of *migration as adaptation* that leads us to ask: Adaptation for whom? At which societal level? and At whose cost?

From the perspective of research on migration and inequality comes a further set of questions, such as:

Which conditions enable (or inhibit) migrants' ability to remit?
What are the effects of remittances on the well-being of those who stay behind?
What are the consequences of out-migration on the infrastructure of the emigration regions?
Does depopulation occur and what are the long-term effects?

We must acknowledge that the relationship between migration and adaptation is as complex and multilayered as is the relationship between migration and environmental change. In the remainder of this chapter, we will shed light on the above questions and consider how they relate to the inequalities inherent in the migration option and its outcomes. First, we will briefly summarize some of the discussions about inequalities within the environmental migration debate. We will then reflect on the preceding chapters of this volume, focusing on how inequalities have been traced and addressed in their empirical findings, in their methodological approaches, and in their discussion of policies that address environmental change and migration. We will also take a closer look at the lessons learned from migration research on the relationship between inequalities and migration. Finally, we will ask how and to which extent the dimension of inequality is addressed in the policy instruments that address environmentally induced migration.

13.2 Rethinking the Linkages Between Migration, Adaptation, and Inequalities

The *migration as adaptation* paradigm has its origins in the New Economics of Labour Migration (NELM) approach, where the household is the unit of analysis. In brief, the NELM approach views migration as an income and risk-diversification strategy, particularly for households with livelihoods that are less resilient to external stressors including environmental change (Adger et al. 2002; Stark and Levhari 1982). Remittances become an important component of household income; the poorer the household, the larger the proportion the contribution of remittances to the household's income might be. For example, a study of five southern African countries concludes that over 80 % of poor households' basic needs such as food, school fees, clothing, and transportation are covered by remittances (Crush and Pendelton 2009). However, the meaning of remittances for poverty alleviation differs depending on the place and type of remittances. In Guatemala, for example, internal remittances amount to 50–60 % of total household income on average (Adams 2006). But in Morocco, international remittances form 53–59 % of household incomes (De Haas 2006). The general experience is that remittances accrued from international migration are higher than those from internal migration.

Using NELM concepts, it is easy to conclude that successful migration (and the remittances it generates) will increase the in situ adaptation and coping strategies of the sending household and thus improve its resilience to future environmental stress. This explains the logic and the ease of viewing *migration as adaptation*. However, as was suggested in Chap. 1 (Fig. 1.2 Generic representation of the relationship between inequality, vulnerability, and environmental migration), a successful migration outcome depends on the availability and access to required resources, the pre-existing level of household vulnerability, the prevailing economic opportunities and institutional context, and the overarching macro-level trends and dynamics. The resources and conditions necessary for success are a reflection of existing inequalities. Further, not only do they determine the degree to which *migration as adaptation* can be successfully realized, the migration outcomes often feed back into the social inequalities that stimulated the environmentally induced migration in the first place. For example, a modicum of financial resources is required for migration, especially cross-border migration. Lacking this, the poorest of the poor rarely engage in long-distance migration. Therefore, this latter category seldom benefits from remittances to the extent better-off groups can. In this way, remittances from international migration often reproduce the class and opportunity structures in the emigration locales.

Because NELM-inspired research treats the household as the main social unit where decisions on migration and the use of remittances are made, it has been criticized for ignoring inequalities and differences in agency within the household itself (Faist 2000, pp. 40–42). Or as De Haas (2007, p. 19) puts it, the NELM approach treats "households as monolithic, internally altruistic units making unanimous decisions to the advantage of the whole group." In environmental

change-migration literature and in the preceding chapters of this book, we see researchers tackling questions of inequality, including intra-household inequalities, head-on. The latest IPCC report on adaptation also pays considerable attention to inequality and its links to mobility, and to *migration as adaptation*. It recognizes that differences between persons and groups (somewhat misleadingly called "identity markers" in the report), such as gender, class, ethnicity, age, race, or (dis) ability, typically feed into "intersecting dimensions of inequality" and result in "multidimensional vulnerability" across different scales of income and status that are represented as a continuum between "privileged" and "marginalized" people (IPCC 2014, p. 807, Fig. 13.5). The IPCC further points out some of the consequences of inequalities for *migration as adaptation*. For example, they note that male out-migration frequently leaves women with more duties; that children and the elderly typically enjoy less mobility; that low-income groups in urban areas (including migrants) face more risks than do other citizens; and, that pioneer, long-distance, and international migration are adaptation options "restricted to wealthier populations" (IPCC 2014, p. 50, Box TS.4 and p. 768).

A preoccupation of the IPCC's discussions of migration as adaptation is the circumstances under which household migration becomes a successful adaptation and when it is unsuccessful or leaves people worse off (typically referred to as *maladaptation*). As with other types of human action and societal processes, when migration takes place, there are winners and losers—successful and unsuccessful outcomes—distributed across societal levels. A successful outcome for the household may simultaneously leave subordinate individuals within the household less well off—or vice versa. Similarly, migration outcomes beneficial to individuals or households may have adverse effects on the adaptive capacity of other members of the same neighbourhood or community. To date, there has been limited systematic research into the multi-scale impacts of adaptive migration on sending and receiving communities. McLeman (2010), and McLeman and Ford (2013) have looked at the demographic consequences of migration in rural and remote communities in Canada. Banerjee et al. (2013, 2011) used household surveys to estimate local job creation from investment of remittances at the place of origin in the Himalayas. We consider this to be a significant gap in the research because, until we are able to systematically understand the differential impacts at destinations and on the host communities' adaptive capacity, it is exceedingly difficult to gauge the potential for migration to be successful adaptation to climate change.

13.3 Inequalities, Migration and Adaptation: Findings from This Volume

The authors who have contributed to this volume have done an impressive job of recognizing and engaging with the complexity of the linkages between *migration as adaptation,* inequalities, and the consequent risks and opportunities that are

differentiated across scales. The conclusions in the preceding chapters are largely aligned with the latest research findings. They show how the capability to turn migration into a successful adaptation strategy depends heavily on the socio-economic circumstances of the household, and its access to the material and non-material resources that facilitate mobility and migration to promising destinations. Resources include not only monetary assets, access to social networks, and citizenship, but also status-related characteristics such as belonging to particular educational or occupational groups, as well as having the power to make decisions on who migrates and how remittances are spent. Not entirely surprising is the consistent theme throughout this book that persons and groups with higher social status are better positioned to take advantage of *migration as adaptation*—though typically less in need of it—than those in lower socio-economic statuses. For the latter group, migration is more likely to occur as an emergency response where the migrants have limited agency, and the chances of a successful outcome are less likely. The following summarizes the most important findings made by the authors with respect to empirical evidence, methodological considerations, and policy implications.

13.3.1 Empirical Findings from Case Studies

The preceding chapters clearly demonstrate the relevance of social inequalities between households for their capacity to opt for migration and turn it into a positive adaptive experience, or not. Various heterogeneities have implications for the decision to use migration as an adaptive strategy, such as income and wealth, gender, and occupational status. Etzold et al. (Chap. 2: Bangladesh) and Tan (Chap. 5: China) show how the poorest of the poor rarely migrate when confronted with environmental hardship, and this group can find themselves *trapped* (a term coined in Foresight 2011) in situations. In other words, some people are too destitute to opt for migration (see also Ahmet 1997). What *trapped* means in practice is operationalized by Tan's quantitative study. Tan defines it as having access to neither migration nor in situ options to respond to environmental stress. Etzold et al. add details to our understanding of *trapped-ness* (for lack of a better term) by showing that female-headed households are more likely to be affected by poverty and are thus less likely to migrate. Rademacher-Schulz and Schraven (Chap. 3) find that female-headed households in Ghana are often socio-economically marginalized, have higher dependency ratios, and have comparatively low rates of ownership of land, livestock, and other critical assets. Conversely, Etzold et al. and Tan find that comparatively well-off households and those with members of high status occupations are also less inclined to migrate, presumably because they enjoy greater resilience and have greater capacity to adapt in situ. In the cases studies, those who opt for migration are often from the middle of the socio-economic spectrum or from the upper ranges of the poorer socio-economic strata. In their research on planned relocations of flood-prone settlements in Burkina Faso, Lassailly-Jacob and Peyraut

(Chap. 4) find that mobility is of greater importance if relocated households are to maintain their livelihoods. Here again, it is the poorer households that are unable to relocate fruitfully. They cannot afford the costs associated with commuting to distant jobs from these new relocation sites, or moving of their own accord to more conveniently located neighbourhoods. The relocation process consequently creates new *trapped* populations dominated by the poorest.

The capability to turn migration into a successful adaptive strategy does not refer solely to the ability to make the dichotomous choice of whether or not to migrate. Inequalities can also affect the timing of migration and the choice of destination—the temporal and spatial patterns of migration as adaptation. The Ghana case study of Rademacher-Schulz and Schraven (Chap. 3), for example, reveals that members of poorer households tend to migrate away during the rainy season, whereas better-off households do so during the dry season. At first glance, the timing of the former seems counter-intuitive because it conflicts with the agricultural calendar, which sees labour demand highest during the rainy season. It is explained, however, by two factors: poor households may lack sufficient livestock and food reserves to see all members through the lean period before harvest; and, during the northern rainy season, demand for agricultural labour peaks at the migrants' destination, the cocoa and maize belt. In Haiti, Mezdour et al. (Chap. 7) find that the differentiation in migration destinations is a function of the socio-economic conditions of sending households. The poorest of the rural poor tend to migrate internally to large cities within Haiti (often Port-au-Prince), while slightly better off rural migrants may be bound for the Dominican Republic or other nearby Caribbean destinations. Meanwhile, wealthier urbanites are more likely to undertake international migration to distant destinations. The type of destination has implications for the size and volume of remittances; on average, international migrants remit more than internal migrants (see also Sect. 13.4 below).

Though international migration may be more promising in terms of the remittances that might be generated, it entails greater risks. There are also many barriers to potential migrants' agency. For example, in their analysis of migration from small Pacific island states, Fornalé et al. (Chap. 11) show how legal immigration schemes depend foremost on the labour demands of destination countries, which tend to discriminate between high-skilled and low-skilled migrants, and often favour temporary migration over permanent migration. Fornalé et al. find that migrant workers, particularly lower-skilled ones, seldom receive the same social security and health care entitlements as native workers. Barriers such as these push some people into undocumented, illegal migration. In addition, the temporary nature of many migration schemes regulating labour immigration means migrants who enter a country legally may become illegal if they overstay. Mayer (Chap. 12) observes that the UN treaty protecting the human rights of migrant workers and their families has been ratified by only a limited number of states, none of which are major destination countries for migration. The same applies to earlier ILO conventions from the late 1940s onwards that regulate the employment of migrant workers. But even if the ratification rate were better, international conventions such as these frequently lack enforceability (Faist 2009). Cumulatively, these barriers

rule out long-distance, international migration as a potential form of *migration as adaptation* for many of the world's populations most vulnerable to climate change.

Many of the case studies in this volume extend the NELM approach beyond its focus on the household as unit of analysis, by considering the different interests and expectations of agents within households. Several refer to the divergent perspective on migration seen between age groups. Rademacher-Schulz and Schraven (Chap. 3), Lelandais (Chap. 6), and Schmidt (Chap. 8) observe that the rural-to-urban migration of rural youth is frequently motivated by the desire to pursue livelihoods other than agriculture, and/or by dissatisfaction with the options available closer to home. In this way, Schmidt highlights how members of a household can have different perspectives on migration depending on their age, and how these perspectives can be influenced by and/or conflict with opinions of others within a community. Rademacher-Schulz and Schraven point out that gender is also relevant when considering the migration and adaptation perspectives of individuals within the household. Because environmentally induced migration is often migration in search of labour opportunities, the household of origin loses part of its workforce as a result. The loss of an individual to out-migration reduces the number of mouths to feed, but it creates greater workload for household members left behind. Because it is frequently males who migrate, the latest IPCC report indicates that this pattern contributes to the "feminization of responsibility" resulting from environmentally induced migration (IPCC 2014, p. 809; for examples from Pakistan, Niger, South Africa, and Vietnam see Gioli et al. 2014; Goh 2012; Campbell et al. 2009). But even when women migrate, the social costs of their absence are frequently shouldered by the remaining female family members—grandmothers or aunts for example (Parreñas 2005). In particular, the duty to care for children and other dependent household members is often assumed by remaining female relatives (MacGregor 2010, p. 262). We finally draw attention to Schmidt's observation (Chap. 8) that the participation of males versus females in migration is highly dependent on the attribution of gender roles within a community, and this can vary between communities even over short distances.

13.3.2 Methodological Considerations

Methodological reflections by Ackerly (Chap. 9), and Greiner and Sakdapolrak (Chap. 10) suggest ways to deepen future analyses of environmentally induced migration. Ackerly considers how social inequalities not only lead to forced migration, but can also stimulate increased morbidity and mortality of specific population groups in Bangladesh, particularly females. Her approach aims at revealing the systemic deprivations and inequalities that are hidden beneath the surface of behaviours, and that social processes can become so familiar they are accepted as *normal*, even though they produce *coerced choices* and *fragmented vulnerability*. She illustrates this by using interdisciplinary and multi-scale analysis to look at the societal mechanisms of exploitation and marginalization behind

environmental change and migration. She shows, for example, how dam construction in Bangladesh and the expansion of the shrimp industry to serve global markets produce dynamics that deprive the poor of access to lands they have traditionally farmed, pushing them to migrate in search of unskilled work elsewhere. Ackerly's approach is particularly helpful in building a more holistic understanding of the who, when, and why of environmentally induced migration, and we see elements of it in case studies found in other chapters. One example is Lelandais's (Chap. 6) description of the political conditions that frame environmentally induced migration on Turkey's Konya Plain. There, national agricultural policy and insurance schemes favour large-scale, irrigated agriculture operations over small-scale farmers. This triggers a cascade effect of land concentration, water shortages, and persistent desertification, all of which perpetuate rural socio-economic inequalities and out-migration.

Greiner and Sakdapolrak's political ecology of translocality considers an element often missing in empirical case studies on environmentally induced migration: the link between places of origin and places of destination in environmental and other matters. They describe how third spaces *in between* emigration and immigration regions emerge—a phenomenon that has elsewhere been called "transnational social spaces" (Faist 2000) or "transnational social fields" (Basch et al. 1994). Such cross-border—and, by implication, internal—social spaces or fields usually provide locally specific ties, hence their translocality. These social spaces are often based on the social relationships maintained between the migrants and their home communities, which can last for decades. The authors invite us to examine the transformation of human-ecological relations in sending and receiving areas, through such things as changes in land-use intensity as populations rise or fall, the introduction of new conservation techniques, or the reckless exploitation of natural resources and pollution of the environment. Such transformations can be positive or negative, and sometimes surprising. In the notable and intensely studied example of Machacos County (Kenya), high levels of in-migration led to an improvement of the local environment, contrary to the traditionally held view that increasing population densities invariably lead to environmental decline. In that example, returnees brought with them new soil conservation skills learned elsewhere—an example of how translocality and migration can reduce vulnerability (Greiner and Sakdapolrak 2013; Tiffen et al. 1994). Another important aspect of the concept of translocality is that it recognizes that remittances comprise both material (monetary and in-kind) and non-material transfers (such as knowledge, skills, and customs) called "social remittances" (Levitt 1998). Schmidt's case study of two villages in Mexico (Chap. 8) suggests that non-material remittances can even include the proclivity to migrate (or not) under conditions of environmental stress, which is reflected in a village's migration history (or lack thereof). In our view, research on the relevance of social remittances for *migration as adaptation* is not yet as developed as that on material transfers.

13.3.3 Policy Frameworks

The methodological chapters of Ackerly (Chap. 9), and Greiner and Sakdapolrak (Chap. 10) point to the fact that national and international policies shape exposure and vulnerability to particular environmental risks. They also point out that these policies may cause involuntary migration and/or create trapped, impoverished populations. This applies both to policies that directly respond to the challenges of environmental change or related migration and displacement, as well as to policies with unintended, second-order, impacts on the environment and affected (potential) migrants. Ackerly's chapter, with examples from Bangladesh, provides a very good interpretation of the latter set of policies. In this section, we will focus on policy responses directly tied to either environmental change or environmentally induced migration.

Policies that address environmental change do not automatically relieve pressure on environmentally induced migration. Well-intentioned responsive actions by governments and other actors may build adaptive capacity for some members or sectors of society while reducing the adaptive capacity of others. This may be due to the institutional and policymaking environment itself, especially if care is not taken to consider how policies tackling one problem interact with policies undertaken for other reasons or by other levels of government. The Turkish case described by Lelandais shows how anti-desertification policies enacted at the federal level are often inconsistent with knowledge, objectives, and policy imperatives at local levels. Another reason well-meaning policies may have unintended consequences for adaptation and migration is that they are enacted without due consideration of (or indifference to) the prevailing socio-economic inequalities within the exposed populations. Turkish climate change, water management, and anti-desertification policies and programs appear to be primarily designed with larger landholders in mind. The knock-off effect of which is that small farm operators often find themselves further disadvantaged. In the end, this only provides added incentive for out-migration from small farms on the Konya Plain and creates a self-perpetuating dynamic of increased vulnerability among the rural population.

From their research in Burkina Faso, Lassailly-Jacob and Peyraut (Chap. 4) also provide evidence of how poorly considered policy responses can reinforce vulnerability by aggravating existing societal inequalities. The residents of flood-exposed, informal settlements struggle to survive on the economic margins of Burkinese society. They know that living in such locations is inherently risky, but do so to have easier access to labour market opportunities and/or productive land. In attempting to *solve* the problem by relocating residents of flood-prone areas to distant settlements, the authorities may have protected them from future inundations, but have failed to provide them with the means to access their former livelihood opportunities. This has made the poorest of the flood victims even poorer by depriving them of the few economic benefits they had—access to water for irrigation and fishing. Compensation schemes for those affected by the flooding

were limited to house owners, and thus discriminated against those who experienced losses of other types of assets. Compensation schemes also allocated more resources to victims in urban areas than to victims in rural areas, further deepening the socio-economic inequality between urban and rural populations.

While the previous examples consider national-level policy implications, Fornalé et al. (Chap. 11) consider how international migration might become part of the larger adaptation strategy of low-lying Pacific island states in coming decades, as rising sea levels and extreme weather events become more prevalent. International labour migration is already an important livelihood strategy for residents of many Pacific island nations, and so it is a seemingly rational policy response to seek to enhance adaptive capacity through migration. However, what is seen as good for building adaptive capacity in a vulnerable sending nation, may not necessarily be welcomed by receiving countries, whose primary interest may be to protect their own employers and labour force. In Fornalé's examples, the (in) equalities considered are those between nations. In one sense, overcoming barriers to interstate movements of labour migrants is a challenge not unique to climate-related *migration as adaptation*. Would-be migrants from sending nations are invariably at the mercy of the immigration policies and regulations of receiving nations, regardless of their motives for migrating.

In our final chapter, Mayer (Chap. 12) observes that, in an ideal world, the rights of migrants and would-be migrants would always be protected, regardless of the circumstances that put them in such situations. We might equally add that, in that ideal world, the right to be protected from having to experience the adverse effects of anthropogenic environmental change would also be enshrined. By design, this book takes one small subset of the world's migrant population—those who migrate in whole or in part for environmental reasons—and deliberately privileges them for scholarly purposes. But, Mayer asks, should we also be privileging them for policymaking purposes? By doing so, he points to the inequalities involved at the discursive and the policy levels. The discourse puts emphasis on those who are (potentially) pushed to migrate for environmental reasons and may consequently need support to turn the migration into a successful adaptation experience, or else be provided with the means to adapt successfully in situ. Such a discourse is implicitly discriminatory, since it ignores people in similar predicaments but not for environmental reasons (e.g., economic change), and also ignores those who are trapped and lack the potential to become migrants. We must therefore be careful to avoid creating through policy different classes of vulnerable people, where some become entitled to international humanitarian and development assistance while others are not. As Fornalé et al. observe, the most pressing challenge is for the international community to agree on labour migration policies and on global economic policies that will enhance the adaptive capacity of vulnerable people, and thereby provide them with the capability to choose with full agency between staying or leaving their homes and communities.

13.4 Linkages Between Inequalities, Migration and Development: Lessons from Migration Research for Investigating Migration as Adaptation

Over the last two and a half decades, focus on the proximate causes of environmental migration has shifted to looking at the processes involved in environmental migration. This is done through systematic analyses of the interdependent variables, and their interactions and feedback. The contributions to this volume add to the broader literature on environmental migration by highlighting: how migration and the concomitant remittances have the potential to alleviate poverty; how different individuals within a household will experience the impacts of migration differently; and how the potential success of migration as an adaptation strategy is strongly influenced by inequality between households. In spite of this progress, there are still many lessons to learn. We might, for example, compare the findings to date from the *migration as adaptation* research with the more general research on migration and development, to glean further insights into the complex relationship between remittances, inequality, changing life chances, and the associated risks. In doing so, we identify three particular issues that warrant additional discussion, given their inherent connections with inequality that can arise from and contribute to environmental migration. These include:

- questions of compliance with the implicit social contract made between the migrant and the household
- the differential costs, benefits, and implications of international versus internal migration
- the relative impacts on communities of origin resulting from such things as the drain (or gain) of human capital, the time-scale of migration, and the spatial-scale of migrant investments, all of which have a bearing on the meaning of migration for development and its complex relationship to inequality.

We begin with an important assumption on which the *migration as adaptation* discourse is based, namely, that migrants will typically remit back to the sending household [referred to elsewhere as the migrant-family contractual arrangement (Stark and Lucas 1988, p. 446)]. Often migrants do not send remittances on a reliable or sufficient basis—or sometimes at all. The most common reasons are insufficient income or inability of the migrant to find employment at the destination (ibid.). Other reasons include unexpected situations of forced labour, imprisonment, or severe illness. In some cases, the migrant might start a new family at the destination. On the other end of the social contract, members of the sending household are expected to support the migrants in undertaking their journey until they have successfully found employment at the destination. This support may also fail should the sending household experience severe crisis, including ones of environmental origin. While there does exist a significant body of literature and case studies on remittance compliance (e.g., Carling 2008, 2014; Poirine 1997; Rapport and Docquier 2006), little research has been done, to our knowledge, on compliance

with the social contract in situations of environmental distress migration, particularly in the case of post-disaster migration. It is worth exploring more deeply how migrants and sending households (re)act and comply with the social contract under such conditions.

Even when migrants remit and fulfil social expectations, to what degree do their remittances alleviate stress and poverty, or reduce existing inequalities? Lessons from the general migration scholarship suggest that international remittances have a greater impact on household and community well-being at the place of origin than do remittances from internal migration. This is primarily because on average international migrants tend to remit more money than internal migrants. The difference between internal and international remittances also has implications for inequality. For example, a study in rural Mexico (Taylor et al. 2005) used a small household survey (2003) to examine the impact of internal and international migration and remittances on inequality and poverty in the sending areas. The authors found that internal remittances (from elsewhere in Mexico) and international remittances (mostly from the U.S.) had different impacts. They determined that a 10 % increase in international remittances reduced the number of people living in poverty by 0.8 %, while a similar increase in internal remittances reduced the number of people living in poverty by only 0.4 %. At the same time, a 10 % increase in international remittances increased overall rural inequality by 2.8 %, while a similar increase in internal remittances reduced rural inequality only slightly (0.1 %).[2] These examples show clearly how international remittances have much stronger overall repercussions for sending communities: they have the potential to reduce poverty, but also have an even greater potential to exacerbate inequality. Just the same, the importance of internal remittances for household incomes cannot be overstated. As we mentioned in Sect. 13.2, in some cases internal remittances can represent up to 60 % of poor households' budgets.

Another avenue that warrants exploration in the context of environmental migration is to consider the gender dimension in terms of the household's aims and aspirations vis à vis female migrants and remittances. There is clear evidence that female migration has a differential impact on the household because women's development agendas frequently differ from those of men (Dannecker 2009).

In cases of both internal and international migration, the question arises whether out-migration will lead to increased social fragmentation of the sending community. Several chapters in this volume report that those who stay behind are usually not of working-age (e.g., children, elderly) or are too poor to afford the costs of migration. Because out-migration drains the sending communities of valuable labour, the overall resilience of the community of origin—in terms of social systems as well as physical maintenance—may be threatened. In the general migration literature, we find examples where high levels of out-migration have led to a complete breakdown

[2]The authors stress that these inequality effects differ over region and time. As the incidence of international migration spreads in rural Mexico, its effects on rural inequality become more equalizing over time.

of communities, such as the out-migration from rural Albania in the 1990s (King and Vullnetari 2006). Areas of rural Mexico have experienced pronounced local de-investment and infrastructure decline following high levels of emigration to the United States (Delgado Wise and Covarrubias Márquez 2006). Cases from Morocco and Nepal show that internal migration has a greater impact on rural population decline than does international migration. This is partly because international remittances tend to be higher and thus allow more members of the sending household to avoid the need to migrate (De Haas 1998; Regmi and Tisdell 2002; Klooster 2005). These examples suggest that, since most future environmental migration is expected to be internal migration within low-income countries (Foresight 2011), we should temper our expectations for the adaptive capacity-building potential of migration, particularly until research on such issues becomes available.

The implications or feedback loops of migration for communities of origin extend beyond remittances and distinctions between internal and international migration. Research elsewhere suggests that the question of whether out-migration benefits sending communities or leads to their decay depends on a number of inter-related factors (De Haas 2007; Özden and Schiff 2006; UNDP 2009). First, community resilience depends on whether the out-migration is characterized by skilled or unskilled out-migration, and the extent to which such skills are integral to the livelihoods of those who remain behind. For example, a fishing community with many skilled fishers but few people experienced in selling and marketing fish may be harder hit by the departure of the latter than by the former. The skill levels of migrants often correspond with particular social strata within the sending community and, depending on their social status, it may be a challenge to replace the lost leadership skills of out-migrants. Over the long run, migration and remittances can alter the skills-profile of a community. Case studies in the Philippines, Nepal, Guatemala, El Salvador, and Mexico found evidence that households receiving remittances tend to increase their spending on education considerably, with a resulting positive effect on school enrolment and retention (Adams 2006; Edwards and Ureta 2003; Thieme and Wyss 2005; Yang 2008; De Haas 2007, p. 22). Similarly, the South African Migration Programme found that in Botswana, Lesotho, Mozambique, Swaziland, and Zimbabwe, education is the second-most frequent use of remittances after food, and takes precedence over such things as clothing (Plaza and Ratha 2011, p. 72). In other studies, however, the distinction between internal and international remittances again becomes important. One study of Mexican migration to the United States, for example, found that international migration has a negative effect on investments in education at the places of origin (McKenzie 2006). Such a situation arises when the expected earning potential of skilled labourers is not remarkably greater than that of unskilled workers (think of the classic example of the PhD-holding immigrant driving a taxi). The implication is that if we are to fully understand the role of migration within the larger context of the impacts of environmental change, these feedback loops need to be better understood.

Second, the time scale over which a community's migration history unfolds is important. It may take two or three decades before the use of remittances (international and internal) shifts from covering basic and consumptive needs to longer term investments. Communities that have longer migration histories may therefore be better placed to harness migration as a means of building adaptive capacity or as a means of recovering from sudden-onset environmental disasters. This has not, however, been well researched, despite being a common thread in the *migration as adaptation* discourse. When we look at case studies of post-disaster remittances (Le De et al. 2015; Mohapatra et al. 2009), we find that the remittances in question originate from migrants who departed for and became established at international destinations a considerable time before the event occurred. While short-term, short-distance, internal migration is a common after-the-fact response of households trying to cope with a sudden-onset disaster (e.g., see McLeman 2014 for examples), remittances from such sources are unlikely to be as great in relative terms as those received from well-established international migrants, whether we are talking about short-term recovery or longer term adaptation. This is another subject where more research would be welcome.

Third, how we understand the development impact of migration strongly depends on our relative assumptions about how to define *investment* and the beneficiaries of it. Social scientists have long cautioned that, if *investment* is understood only in its narrow economic meaning of productive investment, we can fail to appreciate the long-term impacts of financing a child's education or the importance of particular sets of possessions, for example. Similarly, if adaptation is understood narrowly as those measures that address the direct impacts of environmental change, such as using remittances to buy drought-resistant seeds, we can overlook sensible strategies such as educational investments to access new long-term livelihood opportunities. We might also overlook the indirect impacts of remittances on the wider sending community including non-migrant households, such as creating jobs in construction (Banerjee et al. 2011) (a beneficial indirect impact) or causing the price of food and other consumptive goods to increase in sending communities (an undesirable indirect impact). Further, in some cases migrants may not invest in their community of origin but in other nearby locations, where they might still be of benefit (in other words, attention to spatial scales matters). De Haas (2007, p. 15) advises that the socio-economic status of the migrant at the destination and the investment conditions at the origin determine the extent to which remittances will benefit the community as a whole.

Fourth, we must take into account the risk of adverse redistribution of resources from places of origin to migration destinations. In addition to familiar terms like *brain drain* and *caregiver drain*, we must also consider *reverse remittances*. Migrants often need to invest considerable sums in order to establish themselves in the destination regions [e.g., to obtain papers to work legally (Khadria 2009; Mazzucato 2011)], and they do not always recoup these investments through the wages they subsequently earn. *Reverse remittances* and the implications thereof need to be more carefully considered in environmental migration research.

Fifth, the destination of internal environmental migrants is often the slums of large cities, leading to increased demands for shelter, education, clean water, medical care, and so on (as seen in Mezdour et al., Chap 7). The influx of migrants into the destination's labour force may put downward pressure on wages or overwhelm the available number of employment opportunities. In such situations, original residents and governing authorities might perceive migrants as a threat to the social fabric and exclude them from access to services.[3] Do the resulting urban ecological decline and plight of migrants represent a successful adaptation or a failure of adaptation? We encourage future research that links environmental migration to research being done on the environmental impacts of urbanization and on the integration of migrants into cities.

Finally, there is the complex interrelationship between the characteristics of the migrant, the sending household, the place of origin, and the destination, all of which complicates our ability to assess inequalities. As noted earlier, migrants from wealthier households are better able to remit larger amounts of earnings, thereby increasing inter-household inequality in the community of origin. At the same time, these households may be more likely to spend and invest remittances beyond basic consumption needs, and thereby have important indirect impacts on the local economy. As a consequence, we might see situations in which overall community well-being increases even though inter-household inequality has increased. However, local inequalities may be transformed if segments of the population that were once marginalized or discriminated against can take advantage of migration to access new labour markets, away from traditional roles and divisions of labour entrenched in gender, ethnic or class relations. Out-migration might also relieve tight competition in local labour markets where opportunities open up for those who remain. These too are questions that research on *migration as adaptation* has yet to date fully explore.

13.5 Limited Acknowledgement of Migration as Adaptation, and Inequalities in Existing Legal Frameworks

Given the many forms environmental migration may take, and the multiple geographical and temporal scales across which it may occur, it stands to reason that the policy implications range from the local or sub-national to the national, bilateral, and international levels. At all levels, the policymaking landscape with respect to environmental migration is fragmented. At present, there exists no international convention, agreement, or accord with binding implications that pertains to

[3]This happened, for example, to Dust Bowl migrants arriving in California in the 1930s. The Los Angeles County Sheriff's office blockaded the California-Arizona border in 1936, to prevent migrants from Oklahoma from entering. See McLeman (2006).

environmental migrants. It is, moreover, significant that existing discussions and initiatives are overwhelmingly oriented towards humanitarian action. Early attempts to push for international action, such as an agreement along the lines of the 1951 UN refugee convention or an amendment to it, emphasize the attribute of emergency. *Emergency* continues to be the main legitimating argument for policies that address environmentally induced migration. For example, given the strong resistance on the international level to broadening the UN refugee convention to include environmental displacees, Finland and Sweden have instead made explicit use of the instrument of so-called *complementary* or *temporary protection* to avoid deporting failed asylum claimants back to countries that have experienced severe natural disasters (Warner 2012). The U.S. has also offered temporary protected-person status to people unable to return to their home countries because of natural disasters. Hondurans (Hurricane Mitch, 1999) and El Salvadorans (earthquakes, 2001) were two recipients of such status (see McLeman 2014, pp. 107–108 for details). However, not all countries take a similar approach. For example, in 2014, New Zealand's highest court heard the case of Ioane Teitiota, a Kiribati national, who asked that he and his family not be deported to his home island because it was rapidly disappearing due coastal erosion exacerbated by climate change. The court accepted the facts regarding the perilous situation of his island, but judged that because there were no human rights bases or circumstances of persecution, he had no legal right to protection in New Zealand (Tully 2014).

Emergency is also the argument for the more modest approach to policy solutions for environmental migrants who do not cross international borders. Attempts have been made to make stronger use of the 1998 *Guiding Principles on Internal Displacement* (Guiding Principles or GPID) (CHR 1998) to address the plight of people involuntarily displaced for environmental reasons. The document, produced through the Office of the High Commissioner for Human Rights (OHCHR) with the acknowledgement of the then Commission on Human Rights (now Human Rights Council), addresses the problem of internally displaced persons (IDPs) generally. However, it explicitly includes in its definition of IDPs persons "who have been forced or obliged to flee or to leave their homes or places of habitual residence…as a result of…natural or human-made disasters" (Introduction, para. 2). Based on this, the Inter-Agency Standing Committee (IASC) of the UN developed two operational policies directed at environmental displacees that are acknowledged by many international humanitarian organizations, if not by UN member states themselves. These policies are the IASC Framework on Durable Solutions for Internally Displaced Persons (2010) and the IASC Operational Guidelines on the Protection of Persons in Situations of Natural Disasters (2011). Borrowing the concept of *durable solutions* from UN refugee protection policies, these policies are aimed at internal environmental displacees and take into consideration questions of local integration, resettlement, and return to affected areas (UNGA 2009).

Interesting from a legal perspective is the fact that the Guiding Principles became quasi-binding regional law in parts of Africa once they were incorporated into the African Union (AU) Convention for the Protection and Assistance of Internally Displaced Persons in Africa (also known as the Kampala Convention,

AU 2009). The Kampala Convention took effect in December 2012 and, as of 2014, it had been ratified by twenty-two of the fifty-four parties to the AU with another seventeen having signed and in the process of ratification. The Kampala Convention goes beyond the Guiding Principles in several interesting aspects. For example, there is the much quoted Art. 5(4) that explicitly mentions climate change. It states that "States Parties shall take measures to protect and assist persons who have been internally displaced due to natural or human-made disasters, including climate change." Less frequently mentioned is Art. 4(2) which encourages signatories to engage in proactive adaptation measures, such as establishing early warning systems, disaster risk reduction strategies, and emergency and disaster preparedness and management measures, and to plan for durable solutions. But here again, the emphasis is on responding to or preventing emergency situations, and not on migration as adaptation or on addressing underlying inequalities related to displacement.

In 2011, the Norwegian and Swiss governments launched The Nansen Initiative on disaster induced cross-border displacement (http://www2.nanseninitiative.org). This initiative was inspired by paragraph 14(f) of the 2010 Cancun Adaptation Framework and the subsequent discussions about climate migrants that was taking place within the UN Framework Convention on Climate Change (UNFCCC) process. Similar to the Kampala Convention, The Nansen Initiative explicitly addresses displacement due to climate change and seeks to incorporate migration planning (including displacement and relocation) into the drafting of National Adaptation Plans of Action (NAPAs) by least-developed countries (The Nansen Initiative 2014a). Non-state actors such as the Sanremo and Bellagio Consultations (Brookings Institution, Institute for the Study of International Migration and UNHCR 2014) have launched similar initiatives to lobby UNFCCC delegates to focus on pre- and post-disaster efforts to actively relocate people from risk-prone environments.[4] Of these various efforts, The Nansen Initiative most consciously takes into account the value of mobility in adaptation by promoting such things as cross-border mobility of nomadic pastoralists in times of drought (The Nansen Initiative 2014b).

In most international policy discussions of environmental migration, little attention is paid to labour migration and other forms of migration and mobility that are more voluntary in nature. This is despite the lobby efforts of actors such as The Nansen Initiative, IOM, and UNU-EHS to integrate mobility—in its positive sense—into these frameworks. For example, the Sendai Framework adopted at the third UN World Conference on Disaster Risk Reduction (DRR) acknowledged the increasing challenge of displacement due to natural hazards and the importance of participation of vulnerable people in DRR planning efforts. But despite best efforts of lobbyists, it is silent on the question of migration and mobility as an adaptation strategy (Kälin 2015).

[4]Almost no initiatives exist that address relocations resulting from mitigation projects and/or large-scale adaptation measures (Schade et al. 2015).

Even less discussion is taking place among policymakers on the subject of inequality in the context of environmental migration. Instruments such as the *Guiding Principles* and the Kampala Convention are explicitly built on international human rights law and international humanitarian law for war and emergency situations. As such, they adhere to the universal human rights principles of non-discrimination and equality.[5] To this extent, they in principle seek to protect against the worst forms of unequal treatment during and after displacement, by emphasizing the rights of IDPs, which include:

I. to be protected against arbitrary detention and other forms of unequal treatment [GPID 12, KC Art. 9(1)]
II. to receive (lost) documents such as passports and identity cards, which they need to exercise their legal rights such as voting (GPID 20, KC Art. 13)
III. to have the possessions they left behind protected against destruction or illegal appropriation [GPID 21, KC Art. 9(i)]
IV. to enjoy freedom of thought, religion, association, and the right to participate in community and public affairs (GPID 22). In the Kampala Convention political participation is explicitly restricted to nationals, and freedom of thought and association etc. are not mentioned [KC Art. 9(2)(l)].
V. to have the minimums of an adequate standard of living (food, water, shelter, clothing, sanitation, health services) and the right to education [GPID 18 and 23. KC Art. 9(2)(b)]
VI. In several paragraphs gender issues and equal treatment of men and women are acknowledged.

However, these instruments are much vaguer with respect to inequalities that precede displacement. The Kampala Convention stipulates a need to "prevent political, social, cultural and economic exclusion and marginalization, that are likely to cause displacement of populations or persons by virtue of their social identity, religion or political opinion" [KC Art. 3(1)(b)]. The Guiding Principles, by contrast, only stipulate a respect for "obligations under international law, including human rights and humanitarian law" as the means to prevent displacement, which builds on the above mentioned equality principle of human rights norms. These instruments are also thin in terms of the protections offered to the labour migration and mobility of environmental displacees—an important practical consideration. Most protections are of the broad-brush variety. For example, both instruments provide for protection of IDPs against contemporary forms of slavery such as sexual exploitation and forced labour (interestingly, in both instruments the latter focuses on children only) [GPID 11(b), KC Art. 9(1)(d)]. The Guiding Principles assert that IDPs enjoy the right to "seek freely opportunities for employment and to participate in economic activities" (GPID 22(b), not included in KC). Both assert

[5]Because the Nansen Initiative has not yet produced recommended standards or principles, it is not considered further in the following reflections on international norms.

IDPs have the right to "move freely in and out of camps or other settlements" and to "choose his or her residence" [GPID 14, KC Art. 9(2)(f)].

The International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (CMW) may in many ways provide a better opportunity to address the more practical risks associated with *migration as adaptation*, even though the CMW's focus is on migrant workers who cross international borders and not on internal migrants. In addition to the protections described in the Guiding Principles and Kampala Convention, the CMW states that it is unlawful to arbitrarily deprive migrant workers of their identity documents and work permits (CMW, Art. 21) and that workers have the right to move freely and to choose their residence (Art. 39); to engage in and even establish trade unions (CMW, Art. 26 and 40); and to have safe transfer of their earnings and savings to their families (CMW, Art. 32 and 47). The CMW also stipulates that cross-border migrants should receive equal treatment to nationals in terms of remuneration and working conditions (CMW, Art. 25); similar access to social security including (un)employment schemes (Art. 27 and 54); medical care (Art. 28) and education (Art. 30); and have similar obligations to pay taxes (Art. 48, 43 and 45). And finally, the CMW emphasizes the right of migrant workers to participate in the political affairs of their state of origin; to be protected from political marginalization in their state of origin; and to be allowed to reunite with their families when desired (Art. 41 and 44).

Another consideration related to environmentally induced international migration is the role of human smuggling and trafficking organizations, and the consequences of irregular entry. When irregular migration occurs, it is the migrant who becomes criminalized and consequently lives in fear of being caught and punished or deported by the authorities. This makes these migrants vulnerable to exploitation. While most of the CMW provisions are aimed at regular migrants, not irregular or undocumented ones, the CMW does state that no migrant worker should be deprived of the rights to medical treatment or to remuneration and working conditions similar to nationals due to conditions of irregularity (Art. 25 and 28). The CMW also calls for international cooperation in combating illegal employment and illegal movement, and to sanction those "who organize, operate or assist in organizing or operating such movements" as well as employers of illegal migrants (Art. 68). International adherence to the provisions of the CMW are a good starting point for future policies on migration, whether or not it is environmental in origin. As with most human rights treaties, the CMW mainly focuses on the rights of individuals—in this case, the migrant—and does not extend to the challenges faced by communities of origin and destination. Therefore, its ability to address the broader range of underlying inequalities is limited. Another, more practical limitation is that the CMW, which came into force in 2003, had by early 2015 been ratified or signed by only sixty-six nations, none of which are among the world's largest destinations for international labour migration.[6]

[6]See OHCHR, status of ratification interactive dashboard on human rights treaties, at http://indicators.ohchr.org/.

From this lengthy discussion of the policymaking and lawmaking dimensions of environmental migration, it is evident that policies and laws are unlikely to address the challenges of the inequalities that underlie migration causation and emerge as outcomes of migration. We see some glimmers of progress in such things as policies that encourage easy and cheap access to bank accounts and money transfers, and that create incentives for diasporas to invest in their home countries and engage in policy development (GCIM 2005). Within vulnerable states, we see the Kiribati government, for example, seeking to facilitate vocational training today for tomorrow's potential environmental migrants, which could reduce inequalities among individuals and households, and enhance their capabilities to make use of migration as adaptation.[7] The IOM is actively promoting circular labour migration programmes, although these are dependent on labour market needs and on the immigration policies of destination countries. Despite promising initiatives such as these, there are many other challenges that have yet to be addressed in substance by policymakers at any level, particularly with respect to inequality at community levels in places of origin and destination. Policymaking challenges or questions that spring to mind include:

- Should policies and programs have built-in needs-assessments, so that support or protection goes first to those households, communities, and populations that are in the greatest socio-economic need? If so, what would needs-assessments look like in terms of criteria?
- At what scale should policies and programs be targeted? Should the focus be on maximizing the benefits for communities as a whole, even though this may aggravate inequalities within the community? By extension, should policies focus on specific groups or on specific types of households, recognizing that this may in turn exacerbate intra-community or intra-household inequalities and, potentially, conflicts?

There are no clear answers to these questions, in part because the specific applications and the specific impacts of a given policy will invariably differ from case to case. We also need to look beyond designing policies that simply aim to manage internal and international migration, and consider how we can address social inequalities (existing and emergent ones) more generally. Priority must obviously be given to helping and protecting the most vulnerable; we imagine few people would argue with such a statement. But moving from platitudes to just policies and effective actions will not be easy at national or international levels. Experience in other fields shows that policymaking is not always guided by high standards of equality and justice. If it were, it would engender greater and more rapid transformation of persistent societal inequalities, and would address head-on deeply entrenched norms and justifications of the same. It will be an improvement

[7]Kiribati's *migration with dignity* policy is explicitly based on education to export its labour and thus to facilitate migration as adaptation for its population. http://devpolicy.org/kiribati_migration_climate_change20120112/.

to the status quo if some aspects of inequality and justice are considered in future policymaking for environmental migration. We are cautiously optimistic that this may be possible, as long as (1) rights-based standards established by international agreements and cooperation are further developed and actually implemented by governments, and (2) intergovernmental agencies and civilians are actively engaged in the process.

13.6 Conclusion

Considerable progress has been made to weave aspects of inequality into the research of environmentally induced migration and its relationship with adaptation to environmental changes. Even so, there are still many lessons to learn about integrating the role of inequalities more systematically into research on *migration as adaptation*. Expanding our research questions and designs, and finding ways to develop and conduct more longitudinal studies would be valuable next steps. On the policy and regulatory side, there is even more progress to be made and many challenges to overcome. Questions of social inequalities that precede or follow environmental migration (or that preclude would-be migrants from migrating) are largely unaddressed in existing policies. The few examples of international laws and conventions that address such inequalities typically lack broad recognition by the international community, and where they are adopted are often not implemented or enforced with any rigour. However…social justice was never achieved easily.

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Afterword

Social Inequality and Justice Triggered by the Anthropocene: An historical view

Chloé Vlassopoulos[1]

The present volume provides valuable insights into the relationship between social inequality, justice, and environmental migration in the climate change era. In this afterword, I will take a step back and trace some important historical moments in the evolution of our thinking on this relationship and how it is being reappropriated at the global level through climate change discourse.

Recognition of the relationship between environmental degradation, social inequality, and justice is not new. In western countries, the origins can be traced to 19th century initiatives to improve environmental conditions in continental European cities, known as the *hygiene movement*.[2] Such initiatives not only linked human health to environmental conditions but also concluded that the poorest were the most highly exposed to a degraded environment. Hygiene experts, who were specialists in urban, social, and industrial hygiene, proposed policy measures to protect the poor against the exposure to pollution. The grassroots environmental justice movement that emerged in the U.S. in the 20th century advanced the issue of the unequal distribution of environmental burdens within the society. This in turn has had considerable influence on current discussions of climate justice, and how vulnerability to climate change is closely linked to social inequality. I will reflect briefly, with additional detail, on each of these evolutionary mileposts and their influence on discourses of climate justice and social inequality in the anthropocene.

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[2]Use of the terms *hygiene* and *hygiene movement* (‘mouvement hygiéniste’ in French) in this context is distinctive from their use in Britain and North America, where the term ‘sanitary’ is preferred. In North America, the term *hygiene movement* is historically associated with personal cleanliness and, more problematically, with the discredited *social hygiene movement* trumpeted by the eugenics movement.

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Hygiene Experts: The First Environmental-Justice Advocates in the 19th Century

Hygiene science emerged in late 18th century Europe and was based on a neo-Hippocratic perception that environmental conditions have a significant influence on human health. Hygienists approached public health by studying environmental quality (e.g., air, soil, water) in order to combat its deterioration and its impact on human well-being. This broad environmental vision of health problems was dominated by what was called the *aerist* approach: the air was considered to have a direct influence on the body and health because it carried miasmas that could transmit diseases. The *aerist* approach led hygienists to focus their analyses on the composition of the atmosphere, and cities, with their heavily polluted air, became living laboratories for their science (Kalaora and Vlassopoulos 2013).

As urban spaces became more crowded and industrialized, the role of hygienists grew in importance. Hygienists began to occupy important positions in administrative and political bodies, extending their political, economic, and social influence, and becoming the principal government experts in combating urban environmental degradation in the name of public health (see Chevallier 2010 for a detailed history of the politics of hygiene in Paris). Emissions from industrial smokestacks, indoor air quality in workplaces, and air quality in low-income workers' neighbourhoods were important targets of the hygienists' efforts.

Statistics and experience quickly began to support the correlation hygienists made between mortality rates, spatial-social inequalities, and environmental conditions. Relocation of heavily polluting factories was seen as a key measure to restoring air quality in poorer residential neighbourhoods. Beginning in the early 1800s, the French government commissioned reports on the emerging problem of co-locating industrial and residential areas. In 1810, these reports led to the first national regulation on *Unhealthy and noxious factories*, which classified industrial facilities into three categories according to severity of pollution and set targets to improve the living conditions of low-income populations living nearby. Article 1 of the regulation declared that industries "…must ensure that the production process does not affect residents in the neighbouring houses." This is one of the earliest European regulations creating legal rights and protections for people exposed to pollution.

Growing concerns for air quality in low-income urban neighbourhoods were accompanied by a series of hygienists' studies on the quality of workers' housing. Workers' housing at that time typically consisted of dilapidated rental units of less than 20 m^2 that owners were under no obligation to maintain. Small factories and workshops of all types sprang up in backyards and within housing units themselves, generating smoke, noise, and vibration. Homes had no individual freshwater supplies, and household waste and sewage was discharged directly into surrounding yards and lanes. In 1844, the famous hygienist M. Lévy was referring to the harmful *family atmosphere* in the workers' residences. An early suggestion of hygienists was for residents in these neighbourhoods to keep windows and doors open all day

long to maintain ventilation. Hygienists also proposed that new residential construction offer more openings and have better orientation (see Murard and Zylberman 1978; Corbin 1982).

As the century progressed, the hygiene movement spread to other western European nations. In France, urban planning measures led to entire districts being demolished in Paris to relieve overcrowding and create new avenues and squares. However, those who were displaced were obliged to seek low-cost housing in other, also overcrowded, neighbourhoods. This could be considered the first planned displacement justified in the name of environmental degradation. However, low-income populations had no choice but to find new low-cost residences elsewhere. Hygiene experts continued to condemn the poor quality of newly built workers' housing "by unscrupulous owners who do not meet the requirements in terms of hygiene" (*Annales d'hygiène publique et de médecine légale*, p. 298) and sounding the need "to offer clean air to the poor" (Corbin 1982, p. 180).

Environmental Justice as a Grassroots Movement: 20th Century

Another notable milestone[3] in the evolution of thinking on the relationship between social inequality, environment, and population emerged in the U.S. in the late 1960s and early 1970s. This was characterized by a move away from the previously anthropocentric approach to a more ecocentric approach to the relationship (Theys 2005). Inspired by Rachel Carson's *Silent Spring* (1962) and having successfully created the Environmental Protection Agency, environmentalists inside and outside the public sector increasingly began to define the environment as an autonomous social value to be protected in and of itself, apart from any benefits human populations derive from it. The shifting discourse justified the shift in the focus of environmental policymaking to the preservation of ecological systems and equilibriums, which would in turn provide beneficial and equitable outcomes for society as a whole. Unlike the hygienist approach, this new approach to environmental protection was not preoccupied with social injustice or human health, leaving these to be dealt with by other policy sectors.

Through the 1970s, events like Love Canal and consequent citizen activism spawned a new grassroots environmental justice movement that deliberately sought to link issues such as racism, poverty, injustice, and environmental degradation into a single discourse (Taylor 2000, p. 514). For example, in 1987 the NGO Concerned Citizens of South Central mobilized the people of Los Angeles to successfully block the construction of a garbage incinerator in an African-American community of the city. That same year, the United Church of Christ's Commission for Racial Justice published a controversial report showing that people of colour were between

[3]There, were of course, other milestones in between.

two and three times as likely as other Americans to live in communities with environmental conditions heavily degraded by industry (Bell 2009). In 1994, U.S. President Clinton signed an Executive Order that affected both the Civil Rights Act of 1964 and the National Environmental Policy Act of 1969. To comply with this Executive Order (EO 12898), U.S. government agencies were instructed to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."[4] Here we see policy being oriented not toward interventions on behalf of populations facing environmental risks and potential displacement, but toward distributing environmental risks more equitably to allow minority and socio-economically marginalized populations to remain in their home communities.

Although both approaches place social inequality at the centre of their concerns and actions with respect to environmental quality and social inequality, the 19th century hygiene movement and the 20th century environmental justice movement exhibit notable differences. The hygienist movement was a community of scientific experts that embedded itself squarely within the machinery of the state, whilst the environmental justice community is citizen-driven, working outside (and often against) the structures of state power. Hygiene experts made protection of the poor their central mission; environmental justice activists challenge social stratifications based on class, race, or gender. Both have sought to protect the most vulnerable from environmental degradation, both have worked inside national borders, and both have sought to demonstrate to decision-makers that we are not all equal with regard to the environment surrounding us.

Environmental Justice and Social Inequality as a Global Concern

Historically, social inequality and environmental justice discourses have been directed at political authorities for the purpose of generating policy measures to protect the weakest, most vulnerable members of a population. Both hygiene discourses and modern environmental justice discourses have pressed states to guarantee equitable protection of their citizens against anthropogenic environmental hazards. Often, the question of the polluter's responsibility has been avoided or downplayed. Rather than eliminating the pollution or consequent degradation, the aim has been one of managing the inequitable distribution pollution. But this is changing.

[4]The executive order can be accessed at http://epa.gov/environmentaljustice/resources/policy/exec_order_12898.pdf, p. 1.

A global environmental justice discourse has emerged in recent decades that seeks to address questions of responsibility (the polluter-pays principle). Applied to anthropogenic climate change, it poses the question: who should bear the costs? The principle of responsibility is clearly laid out in Article 3 of the UNFCCC, which describes the following "common but differentiated" responsibilities:

> The Parties [to the UNFCCC] should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

Put differently, the international community has recognized that, given the historical differences in the volume of greenhouse gas emissions by developed countries, developed countries are considered responsible for the problem and are thus expected to assume most of the cost of mitigation and adaptation. At the broadest levels, this seems just. However, this differentiated responsibility extends only to the relations between states. As far as the social inequality discourse goes, climate injustice remains alive and well within states and societies. At the subnational level, polluters' responsibility disappears, and the onus falls to the state to protect its citizens equitably.

By focusing on environmental migration in the context of vulnerability and adaptation to climate change, the present volume speaks eloquently to the new discourse. The authors have placed under scrutiny a variety of extreme environmental events and examined the types of social inequalities that prevent people from adapting by moving or by remaining in their home communities. As noted in the introduction, one of the most important observations coming out of these case studies is the invisibility of the most vulnerable people to the institutions and authorities that ought to assist them in developing their capabilities.

The case studies clearly show that transferring mitigation and adaptation funding from developed to less developed countries, as proposed by the UNFCCC Convention, the Kyoto Protocol, and the Cancun Agreements, will not be sufficient to address the fundamental, underlying injustice. By disentangling the complex nexus between social inequality, injustice, and environmental stresses at local and subnational levels, the authors reveal two other important issues necessary to move toward climate justice. First, national authorities should meet their responsibilities to protect vulnerable populations by integrating the present and predicted impacts of climate change as a variable to all related policies (regional planning, agriculture, urban planning, environment, mobility, etc.).[5] Second, there is an urgent need to empower the most vulnerable people to reinforce their capabilities so that they are able to exercise greater agency in adaptation processes.

Elements of the 19th century hygiene policy that sought to help the poor overcome their vulnerability, and of the 20th century grassroots environmental

[5]This integration process is sometimes described elsewhere as *mainstreaming* climate change into existing policy processes (Smit and Wandel 2006)

justice movements that mobilized people excluded from power to seize their rights can be found in the current global effort to deal with anthropogenic climate change. In conclusion, I add a final thought on the tension between the new discourse of environmental justice based on the polluters' global responsibility and on the competing discourse that social (in)equality is a product of the (ir)responsibility of local authorities and their (in)actions. The environmental justice discourse has succeeded, not without difficulty, in implementing within the UNFCCC process the maxim of common but differentiated responsibility between developed and less developed countries. It is conceivable that the discourse of social inequality, being a product of local conditions, might be used by climate-skeptics to blame states for the vulnerability of their people to climate change, drawing attention away from the need to hold polluters responsible for their actions and thereby undermine the present global justice equilibrium. Hopefully, research (such as that showcased in this volume) and concerted action will jointly contribute to strengthen the inter-state and intra-state solidarity to build greater adaptive capacity for all as we voyage onwards into the anthropocene.

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