

Regional Perspectives on Migration, the Environment and Climate Change

Frank Laczko and Etienne Piguet

Context

The perception that large numbers of people may be forced to migrate due to the effects of climate change has fuelled a renewed interest in the subject of migration and the environment. Recent estimates suggesting that between 200 million and 1 billion people could be displaced by climate change over the next 40 years have alarmed policymakers. Even though such estimates have been dismissed as, at best, “guesswork” by many experts (IPCC 2007; Foresight 2011), they have helped to focus policymakers’ attention on the linkages between migration and climate change. Concerns about the migration-related consequences of climate change have encouraged policymakers around the world to focus more on how environmental change will affect people’s lives and human security. The Chairman of the leading expert authority, the Intergovernmental Panel on Climate Change (IPCC), for example, has talked about the “human faces of climate change” (Piguet 2013). Unlike indicators of environmental health, such as carbon dioxide (CO²) emissions or changes in rainfall or temperature, migration reflects the human dimension of climate change.

This book focuses on the likely effects of environmental change – particularly climate change – on migration. Its title (*People on the Move in a Changing Climate*)

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reflects the fact that many people who migrate due to environmental factors, like most migrants in the world today, do not cross international borders. Migrants who move for environmental reasons are also likely to fall into many different categories, and not all migration linked to environmental change can be described as forced displacement. Except in extreme cases, population movements tend to be the result of a multi-causal relationship between environmental, political, economic, social and cultural dimensions. Although media and policy attention tends to focus on disasters and displacement, it is important to keep in mind that environmental factors do not affect all individuals, households and communities equally, and information related to climate change is not perceived in the same way everywhere and by everyone (Piguet 2010a: 517). Even when confronted with severe environmental push factors, people and communities are resilient and have some degree of control over their decision to migrate or to choose other adaptation strategies. Some people, for example, may choose to migrate to avoid the impact of environmental change and therefore have time to plan their move. Others may decide to move temporarily, while the environmental situation is poor. In this sense, migration can become a way of adapting to climate change, for some people, rather than being viewed merely as a problem.

Research on Migration and the Environment

Migration and the environment is not a new area of research. As early as 1992, for example, IOM published a report – *Migration and the Environment* – that stated:

Large numbers of people are moving as a result of environmental degradation that has increased dramatically in recent years. The number of such migrants could rise substantially as larger areas of the earth become uninhabitable as a result of climate change (IOM 1992).

For many years, however, the topic has been neglected by researchers. In the 2005 report of the Global Commission on International Migration, for example, there is barely a mention of migration and the environment. This may be partly due to the lack of consensus among researchers as to whether or not environmentally induced migration is a distinct form of migration worthy of special study. There has been considerable disagreement about how to conceptualize the relationship between migration and climate change and migration and the environment. Although many experts accept that climate change can be a factor in people's decision to migrate, the conceptualization of this factor as a primary cause of forced displacement has been questioned (Black 2001). While the environment can be a driver of migration, usually a complex combination of causes determines whether or not people move. Given the multiple causes of migration, therefore, drawing a clear line between voluntary and forced movements is not always straightforward.

This disagreement over the extent to which the environment induces migration is reflected in further disagreements over terminology. It is common to describe those who move for environmental reasons as 'climate change refugees' or as 'environmentally displaced persons' and to characterize such movements as 'forced

migration'. Popular with the media, the term 'environmental refugees' has been used to describe the whole category of people who migrate for environmental reasons. This broad definition, while evoking an image that has brought public attention to the issue, is not sufficiently precise to describe the whole category of people who migrate due to environmental factors. As noted earlier, in some situations, such as natural disasters, people may have little choice about moving and may be forcibly displaced. In other situations where environmental change is gradual, movement is more likely to be voluntary as people have time to consider their options, and environmental change may be one of many factors inducing them to move.

The Purpose of This Book

Due to renewed policy and media interest in the subject of migration and the environment, there is a growing interest in improving data and research in this field. Policymakers are essentially interested in the following types of questions: how many people are likely to move, who is most likely to move, where will they move to, what will be the likely impact on the origin and destination areas, and how should decision-makers plan for such migration?

The main purpose of this book is to review and compare the existing evidence base in each major region of the world in order to inform policy responses, especially at the regional level. In most regions of the world, there are policy forums that deal with migration issues, such as regional consultative processes (Achieng 2012), but policymakers have yet to fully address questions linked to migration and the environment in these forums. Before launching new studies, it is important that policymakers learn from existing evidence. There are many studies on migration and its linkages to the environment, but the information is often scattered between countries and within regions. This book aims to conduct, for the first time, a systematic review of existing research on how environmental change affects migration across all the major regions of the world. Essentially, the book explores what lessons can be learned from the current body of research; what has been the main focus of this research at the regional level; in which regions of the world the evidence base is weakest; and whether studies that have been conducted in one region of the world could be replicated in another.

The aim of this book is not to elaborate upon, or to synthesize, conceptual and theoretical debates, as this has been done elsewhere (Laczko and Aghazarm 2009; Piguet 2013). Similarly, the issue of the environmental impact of migration is not considered herein, as it refers to a largely different – and significantly older – body of literature (Black 1998; Hugo 2008). The book focuses instead on mapping the existing research on migration and the environment at the regional level, and on pooling together the key findings and results from empirical research, field studies and surveys. To ensure coherence between chapters, the main theme of the book is the impact of environmental change on migration, while recognizing that the environment may not always be the sole factor driving migration.

Structure of the Book

Each chapter of the book is written by leading regional experts using a common framework. All authors were able to draw upon a common bibliographic database that has since been published as a separate reference document (*People on the Move in a Changing Climate: A bibliography*, IOM 2013). As the focus in this book is on regions, there is no specific chapter dealing with small island States. Discussion of the evidence base relating to these islands is included within the respective regional chapters – for example, the chapter on Oceania includes references to the Pacific Islands. In addition, given the paucity of data relating to the Middle East and North Africa, a special chapter was prepared for this region. A specific chapter on the Himalayas was also commissioned as this is one of the areas of the world most likely to be affected by climate change, and several new studies have been conducted in the region. Focusing on this region also allowed for the study of certain environmental factors specific to mountainous regions that have an impact on the movement of people.

In preparing their chapters for this book, authors used a common framework, covering the following key points:

- An historical overview of migration trends relating to environmental events
- A brief synthesis of the regional forecasts regarding climate change, with a special emphasis on those that are recognized as relevant to population movements
- An overview of the main current environmental issues in the region, whether connected or not with climate change
- An overview of the main current internal and international migration trends
- A synthesis of existing case studies on the links between migration and environmental stressors.

Research Database on Migration and the Environment, Created for This Project

The bibliographic database used in this book was prepared by the University of Neuchâtel, with additions from IOM. Keywords are used to enable the reader to identify empirical cases studies, and they are organized according to world regions and the methodology used in the study. Using the database, it is possible to obtain a detailed overview of the existing empirical literature on the environmental impact on migration. This analysis,¹ presented below, builds on earlier but less quantitative assessments completed by other authors (Erway Morinère 2009; Morrissey 2009; Piguet 2010a; Laczko and Aghazarm 2009). The database of research studies shows that, in recent years, there has been a significant linear increase in the number of research studies and publications focusing on migration and the environment (see Fig. 1.1). Indeed, since 2008, more reports and studies have been published on

¹ The quantitative analysis was conducted by Sieun Lee and Frank Laczko at IOM – Geneva.

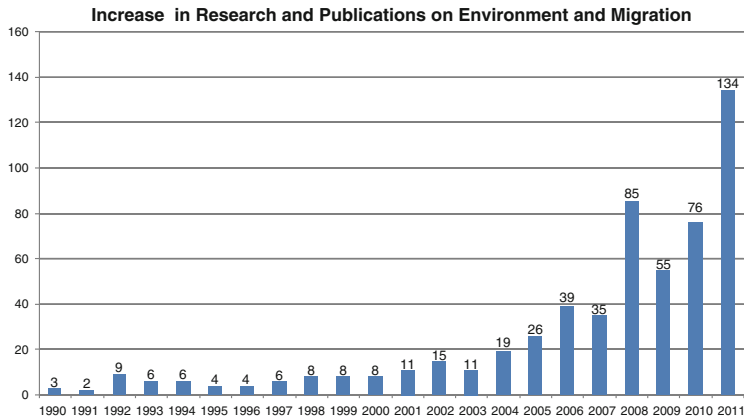


Fig. 1.1 Increase in the number of publications on migration and the environment, 1990–2011 (Source: IOM/University of Neuchâtel)

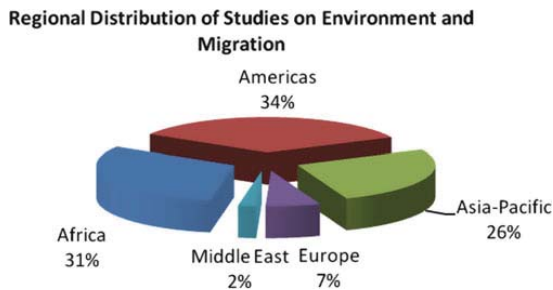


Fig. 1.2 Regional distribution of publications on migration and the environment (Source: IOM/University of Neuchâtel)

migration and the environment than during the whole period between 1990 and 2007. Between 2008 and 2011, 350 publications were produced, compared to 220 between 1990 and 2007. However, an increase in the number of publications does not necessarily mean that more empirical data on the subject are now available, as some reports may draw upon the findings of the same studies.

Most studies in the database focus on migration and the environment at the national level. In comparing regions, it can be seen that the evidence base is much stronger in some parts of the world than in others, with most publications focusing on the Americas (96), Africa (87) and the Asia-Pacific region (74). In Europe (18 publications) and the Middle East (6), the evidence base seems to be much weaker (see Fig. 1.2).

Intraregional differences are also striking, especially in Africa, where most of the studies conducted have been in Western Africa, Eastern Africa and Northern Africa, with very little research being done in Central and Southern Africa. In the Americas, studies focus more on South and Central America than on North America, despite considerable media interest in the impact of climate change following Hurricane Katrina.

Another interesting trend is the growing number of reports and publications focusing on small island States and coastal cities, with 25 publications, to date. Given this geographical imbalance in the number of studies and publications on migration and the environment, some of the authors of this book faced different challenges: for some, the challenge was to review a very large and growing body of literature; for others, the task was to produce a regional chapter using a more limited range of sources and studies that may be only indirectly related to the impact of environmental change on migration.

Typologies and Conceptual Approaches

The bibliographic database also enables the reader to identify another interesting trend concerning the use of terminology. While the number of publications on migration and the environment has gradually increased, the number of studies that use the term ‘environmental refugees’ (a term popularized in 1985 by El-Hinnawi (1985)) is decreasing. For a range of reasons, a growing number of studies have questioned whether it is accurate to describe people who move for environmental reasons as ‘refugees’ – noting, for example, that many environmental migrants remain within their own country. (Between 1985 and 2007, the term ‘climate refugees’ appeared in the title of 48 publications whereas, between 2008 and 2011, it appeared in only 13.)

On the other hand, the term *adaptation* and the view that migration can be a potential adaptation strategy have appeared more frequently in recent publications on migration and the environment. Many studies focus on migration as an adaptation strategy, with 33 of the 44 publications on migration and the environment produced in the period 2008–2011 referring to it as such. The links between migration and human security are also a growing area of research, with 44 publications on this topic having been produced in the same time frame. It is interesting to note that migration will be dealt with under the heading of human security in the forthcoming 2014 IPCC report (WG2-Report-chapter 12). Finally, more publications on migration and the environment focus on issues relating to governance, policy and legal frameworks, with nearly half (22 of the 45) of the publications dealing with this subject produced since 2010. Surprisingly, despite widespread calls for better data, publications addressing the challenges of data collection and research methods remain rare, with only 17 publications having been identified for inclusion in the bibliographic database.

The database also provides an indication of the extent to which publications have focused on particular environmental push factors. The categories and figures presented below show the number of publications relating to the various factors and suggest that researchers have studied a broad range of environmental factors.

Environmental Degradation

- Desertification: 12
- Drought: 17
- Sea-level rise: 17

Natural Disasters and Extreme Events

- Natural disasters: 10
- Extreme events: 5
- Hurricanes: 17
- Floods: 10
- Tsunamis: 5

Overview of the Regional Chapters

Each of the chapters in this volume begins with a general discussion of the expected regional impacts of climate change, which are summarized in Box. 1.1. Each chapter then goes on to review the evidence regarding the likely implications of these and other environmental changes on migration.

Box 1.1: Key Regional Impacts of Climate Change, from the IPCC *Climate Change 2007: Synthesis Report*²

Asia

- By the 2050s, freshwater availability in Central, South, East and South-East Asia, particularly in large river basins, is projected to decrease.
- Coastal areas, especially heavily populated mega-delta regions in South, East and South-East Asia, will be at greatest risk due to increased flooding from the sea and, in some mega-deltas, from the rivers.

Africa

- By 2020, between 75 and 250 million people are projected to be exposed to increased water stress due to climate change.

²See IPCC 2007.

(continued)

Box 1.1 (continued)

- By 2020, in some countries, yields from rain-fed agriculture could be reduced by up to 50 %. In many African countries, agricultural production, as well as access to food, is projected to be severely compromised. This would further adversely affect food security and exacerbate malnutrition.

Europe

- Climate change is expected to magnify regional differences in Europe's natural resources and assets. Negative impacts will include increased risk of inland flash floods, more frequent coastal flooding and increased erosion (due to storms and sea-level rise).
- In southern Europe, climate change is projected to worsen conditions (with high temperatures and drought) in a region already vulnerable to climate variability, and to reduce water availability, hydropower potential, summer tourism and, in general, crop productivity.

Latin America

- By mid-century, increases in temperature and associated decreases in soil water are projected to lead to gradual replacement of tropical forest by savanna in eastern Amazonia. Semi-arid vegetation will tend to be replaced by arid-land vegetation.
- Changes in precipitation patterns and the disappearance of glaciers are projected to significantly affect water availability for human consumption, agriculture and energy generation.

North America

- Warming in western mountains is projected to cause decreased snowpack, more winter flooding and reduced summer flows, exacerbating competition for over-allocated water resources.
- In the early decades of the century, moderate climate change is projected to increase aggregate yields of rain-fed agriculture by 5–20 %, but with important variability among regions. Major challenges are projected for crops that are near the warm end of their suitable range or that depend on highly utilized water resources.

Small Islands

- Sea-level rise is expected to exacerbate inundation, storm surges, erosion and other coastal hazards, thereby threatening vital infrastructure, settlements and facilities that support the livelihood of island communities.
- Deterioration in coastal conditions – for example, through erosion of beaches and coral bleaching – is expected to affect local resources.
- By mid-century, climate change is expected to reduce water resources on many small islands, such as those in the Caribbean and Pacific, to the point where they become insufficient to meet demand during low-rainfall periods.

Asia

Graeme Hugo and Douglas Bardsley start their chapter on Asia by giving a broad overview of current demographic and migration issues. They note that environmental change due to natural and anthropogenic causes has had enormous impacts on Asian societies and associated demographic processes, including human migration. They also point to the recent massive changes in the form and scale of human mobility on the continent. The chapter then reviews major environmental issues for Asia and suggests an important distinction between linear and non-linear impacts. Whereas the progressive increments of linear processes can, to a certain extent, be predicted, non-linear impacts are much more difficult to forecast, although potentially much more dramatic. Identifying thresholds is thus a major task for researchers. What, for example, would be the tipping point in any given country that would force large numbers of people to migrate, due to changes in the environment? With that question in mind, projections of future climatic changes are presented for the continent, and the interaction between such changes and current major environmental phenomena, as well as migration flows, is examined, with a focus on selected subregional countries (Bangladesh, China, Tajikistan and Thailand).

Hugo and Bardsley conclude their chapter by noting that climate change need not have catastrophic outcomes for migration in Asia. The outcomes of the last 40 years of human mobility in Asia suggest that the impact of environmental change can be evolutionary and beneficial, if managed effectively. Policymakers' capacities to respond effectively are, however, hampered by a lack of data and research on existing patterns, drivers and impacts of migration. The research undertaken in the region generally focuses on specific impacts of environmental events, but climate change also has the potential to globally alter the prevailing environments and resources that support livelihoods – an issue that should be addressed urgently, both scientifically and politically.

Europe

In their chapter, Mark Mulligan, Sophia Burke and Caitlin Douglas examine the interaction between environmental change and migration for countries throughout Europe, as well as the Mediterranean countries of North Africa. The authors examine the population, the gross domestic product (GDP), the infrastructure and the impact that environmental factors may have on the socioeconomic landscape, and how this may contribute to migration.

An increase in the frequency and intensity of hydro-climatic hazards, such as floods, droughts, soil erosion and landslides, is projected for Europe, with similar trends anticipated in land degradation, sea-level rise (combined with storm surges), and heat waves. All of these may have implications for patterns of migration, and the European region is potentially very sensitive to shifting climate, given the existence of its strong cultural, economic, political and demographic gradients in certain already climatically stressed conditions, especially in the south. At the

same time, economic demand (as a pull factor) in affluent immigration countries has traditionally appeared to be the most important factor in migration in Europe and, historically, has had more impact than push factors in regions of origin. Although environmental drivers may exert an influence, their impact in Europe may thus be small, indirect and mediated through other social, political, cultural and, particularly, economic drivers. The authors also agree with the well-known forecast that migration induced by environmental changes is likely to be over shorter distances.

The authors conclude that, since GDP increases occur largely in the urban and industrial areas of the northern Mediterranean and northern Europe, cities in these regions may be particularly attractive to migrants from inside and outside Europe, generating increasing spatially concentrated pressures on ecosystems and exposure to hazards. These city regions are also where those who migrate for environmental reasons will be attracted. Meanwhile, and counterintuitively, the countries likely to suffer the most from environmental change over the next 100 years are not necessarily the poorer countries of the southern and eastern Mediterranean, but the wealthier countries around the Alps (due to projected changes in landslide frequency and snow-melt) and the low-lying Netherlands (due to sea-level rise and flooding). It is hard to tell if such countries will experience out-migration as a consequence of these evolutions, given that they have already developed mitigation and emergency-planning strategies.

Sub-Saharan Africa

In his chapter, James Morrissey reviews more than 30 empirical studies in sub-Saharan Africa. As he points out, the four types of studies identified in this particularly rich corpus appear to contradict the general claim that there is a dearth of empirical data on migration and the environment in this part of the world.

One type of study considers the impact on migration of the major droughts of the 1970s/1980s and of other environmental stresses such as rainfall and soil erosion. The findings largely confirm that such events do indeed influence human mobility but they also illustrate the complexities of that relationship and the fact that it is rarely the environmental stress alone that causes people to migrate. In fact, the author asserts that, under certain circumstances, established mobility strategies can be altered to the point of creating a paradoxical decrease in certain types of migration. This group of studies also illustrates the paramount importance of individual characteristics such as gender, class and ethnicity in determining who does and does not migrate.

A second group of studies took a longer-term view, assessing the impact of the progressive drying of the Sahel over half a century. The findings of three studies carried out among pastoralists are analysed in detail and found to confirm the main findings of the first group of studies – further clarifying the complex ways in which climate change can alter mobility patterns and the fact that trends are often characterized by a migratory drift over a long period, rather than by a sudden shift.

Under certain circumstances, migration constitutes an effective means of adaptation but, under others, migrants may end up worse off and risk being marginalized in their region of destination.

A third group of studies takes a much more static approach, evaluating to what extent environmentally better-endowed regions tend to experience more positive migration balances than less well-endowed ones. This approach is close to the subfield of amenity migration studies and to neo-classic migration theories. In this case, contrary to expectations, it was found that fewer people actually migrate out of areas with unfavourable climatic conditions – a paradox explained by the fact that, in the most depleted areas, people experience difficulty in accumulating enough money to migrate.

A fourth group of reviewed studies attempts to model migration behaviour at the individual level (agent-based modelling). Such studies underline the nonlinearity of migration processes and allow for some scenario-building, but the quality of the data on individual preferences for migration is still in need of substantial improvement.

Although not directly allowing for predictions regarding future migrations, this impressive review suggests that the dominant form of mobility in Africa will be cyclical, cross-border, rural–rural and rural–urban, possibly in a stepwise fashion, rather than long-term, long-distance and international. These features reflect the current situation of African migration, as a whole, which is presented at the end of the chapter.

Middle East and North Africa (MENA)

The chapter on the Middle East and North Africa (MENA) was prepared by a World Bank team, led by Quentin Wodon, which utilized a new data set collected in 2011 in Algeria, Egypt, Morocco, Syria and Yemen. The five countries were chosen because of their population size (to ensure that findings would be illustrative), vulnerability to climate change (drought), and levels of socioeconomic development (middle- and low-income countries). In all five countries, climatic and population data indicate that migration will increasingly be induced by water scarcity, aridity and droughts, soil infertility and, in some areas, sea-level rise. For MENA, however, unlike other regions of the world, there are very few empirical studies on past environmental shocks that might have affected migrations. Those that do exist nevertheless confirm the crucial importance of the household and its characteristics, such as socioeconomic status and political context, in the decision to migrate. Due to many intervening variables, the effect of environmental change is not uniform across households, and the decision to migrate is made by individual household members.

Evidence from new household surveys conducted by the World Bank yields new insights about the links between climate change and migration in the Arab world, especially regarding the way populations perceive and connect those two parameters: (1) In the combined sample of the five countries surveyed, more than 75 % of the households in areas susceptible to climate change said they believed

that changes in climate patterns were taking place. (2) Regression results suggest that poor climate and extreme weather events lead to a higher probability of migration, but that the role of climate as a push factor remains smaller than that of socioeconomic characteristics and job prospects in cities. (3) It is estimated that a significant deterioration in climatic conditions would lead to an increase of about 1.5 percentage points in both temporary and permanent migration. Although still based on very few studies and small samples, these results point to the necessity of focusing more attention on MENA countries as possible hotspots where significant migration could take place in the future, due to climate change.

North America

In this chapter, Susana B. Adamo and Alexander M. de Sherbinin begin by discussing migration trends in North America, which are characterized by high levels of international immigration and substantial (but declining) internal population mobility, particularly from rural and small urban areas to large metropolitan areas. The principal climatic impacts that are likely to affect migration in this region are temperature rise, regional changes in precipitation, and decreased winter snow pack – all of which affect water supply. Rising sea levels and storm surges in coastal communities are also of concern, as is the likelihood of more frequent and intense droughts in Central North America. According to the authors, there are relatively few environmental issues in North America grave enough to cause massive out-migration, but the few existing studies on migration related to environmental events in the past nevertheless show numerous associations.

Although it remains difficult to document their effect beyond immediate displacement, hurricanes have, throughout history, impacted population mobility. A key finding is that the degree of housing damage, along with factors such as age, race, education and socioeconomic status, affect the ability to return. Studies of the droughts at the beginning of the twentieth century on the Great Plains of the United States and Canada highlight the fact that migration and displacement are multi-causal. Recent hurricane events have led to an increase in the number of studies on the subject, which also confirms these findings.

These recent studies have also led to interesting advances in data development and alternative data sources for estimating displacement and population redistribution after hurricanes and other catastrophic environmental events. One study suggests combining, on an ongoing basis, census population data and administrative data with data collected after disasters. Louisiana, for example, currently has a negative migration balance, due to the displacement impacts of hurricanes Katrina and Rita. Other studies in the region have covered: population in low-elevation coastal zones; displacement and relocation of Arctic communities in Alaska and Canada; mitigation measures that could directly or indirectly affect mobility; and changes in water availability. In conclusion, the major driver of migration in North America is still clearly related to the economy. However, the examination of relatively new data on possible scenarios of climate change-induced migration

suggests that the direct and indirect contribution of environmental factors at the local level is not insignificant, and that it could escalate and extend to other geographic areas through existing migration networks.

Latin America and the Caribbean (LAC)

After a brief history of the debate on the relationship between the environment and migration, the authors of this chapter – Raoul Kaenzig and Etienne Piguet – identify the main environmental consequences of climate change for Latin America. They then address more specifically the aspects related to tropical storms and hurricanes, floods, droughts, rising sea levels and melting glaciers, which are identified as the main potential migration drivers in the region. The chapter then proceeds with a summary of the past consequences for migration of these environmental changes, after which the authors identify the most important migration issues related to future climate changes. The relationship that can be observed in Latin America and the Caribbean between environmental change and migration confirms the main tendencies noted in other chapters: most displacements take place over short distances, with urban centres exerting a strong pull, while simultaneously being vulnerable to environmental hazards. In the case of sudden catastrophes, displacements are usually short term.

Migration also emerges as a coping strategy that includes leaving and returning, temporary stays, and multiple residences. In addition, the findings of these studies on Latin America confirm that environmentally related displacements are multi-causal and context-specific. The same kind of disturbance can have completely different consequences, depending on the economic, social and political context in which it occurs. Finally, environmentally driven displacements must be considered within their historical context and they occur most frequently between countries that have a pre-existing migration relationship.

Just as, globally, empirical research on migration and the environment is unevenly distributed, geographically, there is also an intra-continental imbalance. In Latin America, many more studies were found on Mexico, other Central American States and, to a lesser extent, Brazil, than on other countries in this region. The Andean countries, for example, along with the continent's north-eastern countries, have remained relatively unexplored. The authors suggest a series of hypotheses to explain this finding: the existence, or lack thereof, of local research centres on migration, pre-established relationships of migration with the United States and, finally, political motives relating to the politics of migration and security.

Oceania

Oceania is comprised of Pacific Island countries (PICs), Australia and New Zealand, but the chapter on this region, prepared by Richard Bedford and John Campbell, focuses mainly on the PICs, as the impacts of climate change are likely to be

greater on these island countries than on Australia and New Zealand. The latter two countries are mainly discussed as destinations for Pacific Island migrants, which they have been, for increasing numbers of peoples, since the mid-1940s – especially Polynesians from the eastern Pacific. Both countries are heavily urbanized (85 % of the population live in towns and cities) and offer opportunities for wage employment and a host of social services that cannot be found on the islands.

The historical overview shows that environmental factors and resettlement have long been a major policy concern in the PICs, especially since the mid-1940s, when the colonial administration purchased an island in Fiji for the purpose of resettling people from an island in Kiribati where the environment was being progressively destroyed by large-scale phosphate mining. In 2012, the Government of Kiribati approved the purchase of land in Fiji to provide long-term security for the people of Kiribati, given the impact of climate change. Migration linked with environmental change long pre-dates the current concerns with global warming and associated rising sea levels. In the future, however, internal resettlement options are likely to be culturally unacceptable in the PICs, as 90 % of the land is held under forms of customary title. Over 500 cases of extreme events and migration have been documented but few allow for accurate estimates of the impact on mobility patterns.

Three key areas of concern have been identified for this region:

1. All but a few Pacific countries are located either fully or partially in areas of tropical cyclones, which are the most frequently reported triggers of disaster in the region. Torrential rains and flood events are associated with tropical cyclones. However very little information is available about mobility patterns after these events.
2. Droughts are relatively common and affect fresh water availability and quality, although there is little literature indicating that droughts cause migration.
3. Sea-level rise has been identified by numerous observers as likely to be the most disruptive of climate change effects, the greatest risk to PICs and the most likely to trigger migration. However, there are as yet no clear cases of climate change having caused the sea level to rise and render atolls uninhabitable.

There is a need for a more nuanced consideration of migration as a climate change response, rather than considering it in dualistic ways as either an inevitability or something that will not happen at all, and one that incorporates both migrating/relocating and host communities. In conclusion, few attempts have been made to predict the number of people who are likely to migrate (within and from the Pacific Island countries) as a result of climate change. For the islands of Oceania, there is a lack of detailed data on the projected effects of climate change, and limited information is available as to how much and whether such effects will reduce the land, livelihood and habitat security of these island communities. Consequently, despite the fact that Pacific islanders are often labelled in the media as the ‘first climate refugees’, the existing data for this region provided limited support for this notion.

Himalayas

This chapter, prepared by Soumyadeep Banerjee, Richard Black, Dominic Kniveton and Michael Kollmair, shows that, although there are insufficient data on the state of the environment in the Hindu Kush Himalayan (HKH) region, it is highly likely that heat waves, glacial retreats and permafrost degradation will lead to increasingly unstable slopes, mass movements, and glacial lake outflows. Heavy precipitation, which will affect landslides, is also anticipated. Currently, there is no coordinated mechanism in the region to collect and compile data on mobility due to natural disasters. The available evidence is based on post-disaster rapid assessments or sporadic case studies.

Despite this lack of data, the HKH region is believed to be one of the hotspots of future climatic impacts as it is highly sensitive to small changes in temperature and precipitation. One of the key factors affecting livelihoods is exposure to stresses and shocks relating to the availability and changing quality of water. It remains a major challenge simply to assess the migration flows to and from the region. It is clear, however, that most of the migrants from this region remain within their country of origin and that cities are the main destinations. In Bhutan, India, Nepal and Pakistan, for example, internal rural–urban migration has been a dominant trend. There are few disaggregated data and studies available on mountain-specific migration but one study nevertheless observed a direct relationship between the type of migration and the altitudinal profile of the native communities in Afghanistan and Pakistan: migrants from mid-altitude regions are mainly seasonal workers with relatively sophisticated professional skills involved in trade and commerce, whereas migrants from high-altitude areas are mainly younger semi-skilled or unskilled individuals. Although not connected to the issue of environmental change, such findings underline the specificities of different mountain areas and the need to adjust data and studies accordingly.

The subsection on environmental drivers of migration reviewed all available empirical evidence from the region and, more specifically, four case studies focused on the relationship between environmental change and migration.

Another important question addressed in the review is the extent to which migrants' remittances help to build resilience against environmental change. The two reviewed studies show that financial remittances are a significant source of cash income for many mountain households and that remittances have been used to procure food, to meet other basic needs during/after a disaster, to re-establish livelihoods, and to rebuild lost assets. In some cases, remittances can also contribute to disaster preparedness, such as strengthening of housing quality or procurement of boats when there are floods. The findings also illustrate the potential role that migration can play as an adaptation strategy in times of environmental variability and change. In conclusion, the evidence from across this region (albeit sporadic) indicates once again that environmental stressors do influence people's migration decisions but not in isolation from non-environmental drivers and other challenges.

Regional Policy Perspectives

This chapter by Karoline Popp presents, for the first time, an overview of selected policy and cooperation efforts among governments on the issue of migration and the environment at the regional level. It aims to complement existing accounts of normative frameworks and policy on this topic, principally from the perspective of international law, international institutions and national policy. Three main conclusions emerge:

- The issue of migration and the environment has arisen in the context of other discourses and policy priorities such as migration, environment, security and human rights. While implementation of explicit migration and environment policies remains rare, the issue has nonetheless begun to permeate policy awareness. Regional policy and cooperation have remained at the level of informal, non-binding dialogue that has, in some instances, translated into ‘soft regional policies’ and, in a few cases, may acquire legal force.
- Limited interest, limited capacity and limited participation may explain why regional consultative processes on migration (RCPs) have been less prominent as a forum for raising awareness of migration and the environment. By contrast, more formal regional institutions have made comparatively greater strides, particularly where the institutional architecture is sufficiently elaborate to prompt different policy sectors within the same regional body to take an interest in migration and the environment.
- In sum, regional policy action on migration and the environment remains incipient, indirect, informal and often incoherent.

Conclusion

A diverse picture emerges from the regional reviews presented in this book. On the one hand, many common features regarding the relationship between migration and the environment worldwide can be observed. On the other hand, many regional specificities point towards differentiated challenges regarding future migration flows, which will necessitate specific policy approaches.

In addition to presenting these observations, the detailed regional overviews further validate many of the insights already reported in recent studies on environmental change and migration:

- *Multi-causality*: Migration is rarely explained by one single driver, be it environmental or not. It is the product of a set of livelihood options, framed by a mix of biophysical conditions and social, political and economic contexts.
- *Migration as a response to environmental stress*: Migration is often seen as a last-resort option, once a certain threshold of stress is reached. Although this may be true for some, migration also represents a potential means of reducing the burden of the environment on the sending household. Migration may therefore be a coping mechanism as well as a consequence of environmental change.

- *Affected populations as victims or agents*: Some studies consider environmentally vulnerable populations to be passive victims, whereas it is important to bear in mind that such populations develop strategies to cope with – and adapt to – environmental change.
- *Remittances*: The transfer of money or goods by migrants to their family members in the place of origin is a proven coping strategy, but the impact of remittances is not yet factored into climate change adaptation plans.
- *Those left behind*: Although migrants are often the focus of media attention as the “human faces of climate change”, most populations likely to be affected in the future will not be in a position to move and may be trapped in their place of residence. These people, rather than the migrants, may be the worst affected by climate change.
- *Short distance*: Where mobility occurs in response to environmental change, it is likely to be over shorter distances, in which case the term *displacement* might be more appropriate than *migration*.
- *Short time*: In the past, when hazardous environmental events have occurred around the world, displacement has usually been temporary, with most people wishing to go back to their place of residence as soon as possible.
- *Threshold*: The literature on migration often implicitly posits certain linearities – or, at least, stepwise processes – in the evolution of migration flows. Yet the patterns of migration that will be induced by environmental change might well be non-linear and (once certain thresholds are reached) characterized by very quick changes – for example, from low to high levels of migration. This underlines the need for forecasting scenarios so that adequate policies can be developed.
- *Urban zones*: In many parts of the world, towns are the main destinations for internal and international migrants, who are driven by, among other factors, environmental change. However, urban settings are often themselves vulnerable to environmental changes, such as sea-level rise, landslides and hurricanes, with the result that migrants may find themselves in a vicious circle of vulnerability.
- *Selectivity*: As in the case of other migration processes, migration linked to environmental change is highly selective and different population groups are affected in different ways, depending on their gender, class, ethnicity, livelihood, social capital, networks, etc.

The book’s regional chapters also reveal some interesting new local specificities regarding the connection between migration and environmental change:

- Different parts of the world will be confronted with very different environmental challenges (see Box. 1.1), which may result in different regional migration scenarios.
- Some regions are more likely than others to be affected in the near future. Whereas certain regions of the world may be affected within decades (for example, by an increased number of hurricanes), others may not be affected for a century or more but may then face huge challenges linked, for example, to sea-level rise.

- Pre-existing migration patterns differ greatly between regions. Even if they had little to do with environmental changes in the past, migration channels and networks will have a significant impact on the development of future environmentally induced migration flows.
- Although it is often suggested that poorer countries are more likely to be affected by climate change-induced migration, the chapters on Europe and North America show that, although rich countries are in a much better position to develop policies for coping with environmental change, they are also likely to see migration linked to such change in the future.
- Physical geography appears to be a very important factor in population movements. Elevation, soil type and erosion are three examples of characteristics that will interact with climatic processes in specific ways in each region of the world.
- Social factors will also be of paramount importance. The chapter on Oceania points, for example, to the issue of the land tenure system as a key factor affecting opportunities for relocation. Regional political blocs and their agreements regarding freedom of movement will also play an important role. Whereas countries of the Northern Mediterranean basin will, for example, benefit from European mechanisms of solidarity and, if necessary, free circulation within the European Union (EU), Southern countries confronted by the same challenges will be in a much less favourable position, in terms of developing migration-related coping strategies.

This book also suggests a new agenda for policy-oriented research on the linkages between migration and the environment, focusing on three key areas:

1. The evidence base in a number of key regions of the world needs to be strengthened to promote new forms of research. In some regions, such as the MENA countries, North America and Europe, relatively little research has been done. In other regions, such as Oceania, South America, Africa and Asia, numerous specific case studies have been carried out but few comparative studies have been conducted. A much more cross-national research, using a common research design, is needed to facilitate meaningful comparisons between countries and regions.
2. The methodological coherence of empirical research should be enhanced. In 2009, a six-group typology of methods used to assess the weight of environmental drivers of migration was identified (Piguet 2010b). This typology encompassed: ecological inferences, individual sample surveys, time series, multilevel analysis, agent-based modelling and ethnographic methods. Although qualitative studies are vitally important, there is a need for large-scale survey studies too – ideally including time series data. More research using quantitative methods is needed, to provide a potentially more representative picture of the linkages between environmental change and migration (Laczko and Aghazarm 2009). The value of this kind of research is reinforced by Piguet, who reports: “The most illuminating and original studies that we have referred to make use of data specially developed through time-consuming collection processes involving qualitative as well as quantitative methods. Comparable efforts shall hopefully be intensified” (Piguet 2010b: 522).

3. There is a need for more studies on specific aspects of environmental change and the likely implications for migration, focusing on mountainous regions such as the Himalayas, the Andes and the Alps, which are experiencing glacial retreat; coastal areas affected by sea-level rise; urban areas affected simultaneously by population growth, infrastructure challenges and environmental disruptions; and drylands experiencing declining water availability and decreasing food production.

Policy-makers and practitioners also need assistance in identifying and interpreting the findings from the growing number of reports and studies on migration and climate change. The establishment of a clearing-house for research on migration and the environment would be useful, as existing studies are currently scattered across different countries, disciplines and journals. The publication of the analytical bibliography that accompanies this book is a first step in that direction. The database will be regularly updated and a series of keywords developed, enabling researchers worldwide to quickly access all relevant available data. The authors count on the community of researchers to help make publications available and to keep a critical eye on this database. The IOM will also be a key actor in supporting this project, which will help spread knowledge and promote sound and innovative research practices for what is likely to be a key global issue in the years ahead.

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