CAMBRIDGE

Cambridge University Press
978-1-107-02265-2 - Climate and Human Migration: Past Experiences, Future Challenges
Robert A. Mcleman
Excerpt
More information

1

An Introduction to the Study of Climate and Migration

1.1 Introduction

Climate influences human migration. Sometimes the influence is direct and obvious, such as when people flee their ruined homes in the wake of a hurricane or tornado and do not return. Sometimes its influence is more subtle, such as when a string of dry years prompts an aging farmer to decide it is time to sell the land to a younger family and move to town. Sometimes climate's influence is nested so deeply in interwoven chains of past events that we no longer notice how it has shaped where, how, and why we live in the places we do. It is not some random act of chance nor deliberate human plans that led southern England, southeastern Australia, and northern New Zealand to become the most densely populated regions of their respective countries, home to urban centers that continue to draw migrants from around the world. Climate played a role.

It is estimated that there are approximately 215 million international migrants worldwide (UN DESA 2011). Relatively few of them migrated for reasons directly and obviously tied to climate. If asked why they moved, most would likely answer that it was because of family reasons, or to search for work or new opportunities. Some might say they had to, because their household had grown too big to be able to support them. An unfortunate number, perhaps 20 per cent of the total, would answer that they had no choice, that they were forced to move because of violence, persecution, or natural disasters (some of which might be climatic in origin). Because climate is in proportional terms so rare a proximate cause of migration, scholars who specialize in migration research have largely tended to consider it in passing, if they consider it at all. Check any textbook used to teach undergraduate courses in migration over the past few decades, and you will find few mentions of climate.

Since the 1980s, natural scientists have accumulated convincing evidence that human activity is causing unprecedented changes to the atmosphere, and that we have entered an era of rapid, human-induced climate change. Warnings that this will create hundreds of millions of environmental refugees in coming decades have led a small

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-107-02265-2 - Climate and Human Migration: Past Experiences, Future Challenges
Robert A. Mcleman
Excerpt
More information

but growing number of scholars to reconsider the relationship between climate and migration. Their research is showing that climatic events and conditions will likely have a greater influence on migration in the future. However, that influence will most often be felt as part of a complex interplay with cultural, economic, political, and social factors that shape human migration behavior and patterns. Further, migration in the context of changing climatic events and conditions is not a discrete, stimulus-response phenomenon, but is typically one of a range of possible outcomes that may result as people adapt to changes occurring around them. The evidence that leads to this conclusion comes from careful examinations of past and present migration events, using a variety of theoretical, conceptual, and methodological approaches to tease out the contribution of climate and the nature of its interaction with other factors. These theories and concepts have been drawn from the natural and social sciences and employ a range of quantitative, qualitative, and geospatial imaging methods. This book provides a summary of relevant scholarship on the relationship between climate and migration, and is intended to serve as a starting point for scholars wishing to pursue further research in this emerging field.

In addition to the basic premise that climate can and does influence migration, several other basic premises underpin this book, which have been drawn from the current literature on the subject:

- The influence of climate on migration occurs in concert with cultural, economic, political, and social factors that are human in origin.
- Migration can be understood as an outcome of processes by which human populations adapt to climatic variability and change.
- Past examples can be used as evidence and learning devices for understanding future linkages between climate and migration.
- When the theories, concepts, and methods used in the often unconnected fields of migration and climate change research are brought together, they provide a powerful toolkit for the scholar.

Before launching this chapter with a review of the longer history of the study of climate and migration, it is worth noting that this book avoids as much as possible making value-laden judgements of whether migration events are good or bad, desirable or undesirable. There is no shortage of others willing to do so. The perspective taken here is that *migration happens*. Governments and institutions may wish to control and organize migration to suit their own purposes, as is discussed in Chapter 2, but the reality is that even in regimes where people's mobility is officially restricted, people will migrate when it is in their interest to do so. Any migration has its costs and benefits for the migrant, for members of the migrant's extended family and social network, and for the larger populations of sending and receiving areas alike. Raising barriers to migration raises the costs of migration, and may therefore restrict the numbers of people able to migrate, but even odious, repressive regimes like in North Korea or

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-107-02265-2 - Climate and Human Migration: Past Experiences, Future Challenges
Robert A. Mcleman
Excerpt
More information

the former 'democratic'[1] Republic of East Germany have found it impossible to fully control and prevent migration and mobility. Migration is therefore analyzed here simply as a phenomenon that may or may not occur depending on circumstances, with the emphasis on identifying the circumstances accurately.

1.2 A Long View of the Influence of Climate on Human Migration

Climate has always been an important influence on human settlement and migration patterns. For the two hundred thousand or so years that *Homo sapiens* has been on the planet, climate and its interactions with other environmental processes have helped shape human population numbers, distribution, densities, longevity, and well-being. Until fairly recently in that long history – that is, until ten thousand to fifteen thousand years ago – climate and other environmental forces were likely among the foremost direct and indirect influences on human migration (Lamb 1982, Fagan 2004). The role of migration in the course of human development, from our earliest origins in East Africa to our settlement and colonization of all the continents (save Antarctica) and major islands of the Earth, from being primarily hunter-gatherers to mostly city dwellers, may be read in a variety of ways. One of these is to look at migration as part of a continual and ongoing process of adaptation. Within this context of adaptation it is possible to better understand the role that climate has played, and continues to play today, in influencing migration.

Adaptation is a process that takes on a variety of forms, including biological changes, behavioral changes, and technological changes (Smit and Wandel 2006). Adaptation implies a stimulus for change – that is, the adaptation of something to something. Evolutionary theory tells us that organisms, including humans, are continually adapting to environmental stimuli so as to enhance the chances that they and their offspring will survive to reproduce. In some regions, such as the northernmost Arctic, the Antarctic, and the great deserts, climatic conditions are so harsh that, after two hundred thousand years, they remain largely beyond the range to which humans have biologically adapted. Humans cannot safely live in such environments for any extended amount of time without implementing a significant amount of technology to overcome our biological limits. This is the first and most obvious way that climate has influenced human population movements, by delineating the human habitat – the regions of the world to which it is biologically safe to migrate and settle.

The distribution and density of human settlements within our climatologically defined habitat is neither uniform nor random. Climate as it is experienced on the ground varies spatially according to latitude, longitude, elevation, proximity to large bodies of water, and other physical factors. Interactions between climate and other elements of the natural environment shape the availability and distribution of resources

[1] It seems to be common that countries that use the word *democratic* in their official name are not democratic at all.

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-107-02265-2 - Climate and Human Migration: Past Experiences, Future Challenges
Robert A. Mcleman
Excerpt
More information

Figure 1.1. Remains of an early settler's farm near the abandoned settlement of Rose Hill, Ontario. The farm was established in the late nineteenth century by a migrant from southern Ontario. The short growing season and poor soils of the region put it on the margins of suitability for agricultural crops; the elevated, north-facing location made this a very poor location for a farm. Nearby villages situated on south-facing locations remain inhabited today. Photo by author.

and ecosystem services critical for human survival and well-being. Even over very short distances climatic conditions exhibit considerable variability. In northern temperate regions, for example, the south side of a hill may experience very different temperature regimes and therefore support different vegetation, animal species, soil conditions, and water availability than the north side of the same hill (Figure 1.1). These regional and local variations in climatic conditions interact with other ecological processes to render certain locations more desirable than others for human settlements.

The Earth's climate is continually changing over long periods of time because of natural processes, from ice age to warm period and back again to ice age. Climate is also inherently variable over short periods of time, from season to season and from one year to the next, obliging human populations to adapt to variations and extremes in temperature and precipitation.

Throughout the longer course of history, there have been many times and places where climatic conditions have changed beyond the capacity of people to adjust to

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-107-02265-2 - Climate and Human Migration: Past Experiences, Future Challenges
Robert A. Mcleman
Excerpt
More information

them through in situ adaptation (i.e. behavioral or technological adaptations that do not require migration), leading populations in whole or in part to respond by migrating elsewhere. Some have been short-duration events that led to migration at local and regional scales, and many modern examples are included in the chapters that follow. Other periods in human history have seen long-duration, global-scale climatic events that led to pronounced changes in population and settlement patterns across wide regions. Captivating and well-researched accounts of such events have been published by scholars including Mike Davis (2001), Jared Diamond (2005), Brian Fagan (2004, 2008, 2009), Michael Glantz (2001), and Hubert Lamb (1982), meaning there is no need to replicate them in this book. It is, however, worth mentioning briefly a few examples from centuries past that today's scholars frequently invoke in discussions of the relationship between climate and migration.

1.3 Notable Examples from the Long Past

One example that scholars have drawn on is that of the medieval warm period (MWP), which lasted from approximately the tenth century to the early fourteenth century, with its peak occurring in the twelfth century (Mann et al. 2008).[2] During that period, average temperatures across much of Europe, Central Asia, Africa, and the Americas rose to levels similar to or even warmer than those experienced today, making them among the highest global average temperatures since the last ice age.[3] The impacts of these warm centuries were particularly favorable in Europe, where climate in the previous millennium had been highly variable, characterized by long periods of harsh winters, droughts, extreme storm events, and sea level change along the coasts (Lamb 1982, Grove 2002). Medieval warming created a benign climate that led to increased European agricultural productivity and expansion northward of warm weather crop production, including the establishment of vineyards in southern England (Grove 2002). It was during this period that Scandinavian Norse began migrating to and colonizing North Atlantic islands. Fully functioning, permanent Norse settlements were established on the Faroes, Iceland, and Greenland, with smaller, ephemeral hunting and fishing settlements built on the island of Newfoundland (Dugmore, Keller, and McGovern 2007).

In contrast with the beneficial climate experienced in Europe, the onset of the MWP in the tenth century brought a series of prolonged, severe droughts to Central America that coincided with the collapse and depopulation of the great cities of the Mayan empire in Central America (Haug et al. 2003, Wahl et al. 2007). A variety of human factors have been cited as having interacted with climate to precipitate that collapse, including intercity warfare, deforestation that led to soil erosion and loss of ground

[2] This period is also sometimes referred to as the Medieval Climate Anomaly.
[3] In East Asia, the tenth through the twelfth centuries were relatively cool, that region having experienced a much warmer period of average temperatures during the seventh to ninth centuries (Lamb 1982).

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-107-02265-2 - Climate and Human Migration: Past Experiences, Future Challenges
Robert A. Mcleman
Excerpt
More information

water, and an increasingly hierarchical and rigid political system that was insufficiently flexible to adapt to changing environmental conditions (Shaw 2003, Orlove 2005). In the American southwest, large pueblos and the famous Anasazi cliff settlements of Chaco Canyon and Mesa Verde arose in the first centuries of the MWP, only to be abandoned over a relatively short period in the twelfth century in the face of severe droughts (Lekson and Cameron 1995). In Asia, climatic conditions were highly variable during the MWP; Fagan (2004) suggests the expansion of the Mongol empire of Genghis Khan and his successors from the Central Asian steppes into China and Europe may have been necessitated by persistent dry conditions on the steppes in the early twelfth century.

The MWP was followed by a general decline in temperatures in the northern hemisphere that culminated between the sixteenth and nineteenth centuries in what has been described as a 'Little Ice Age' (Grove 1988). During this period, European winters became longer and colder, ice skating was widely enjoyed in the Netherlands, and England's River Thames froze over on several occasions (Robinson 2005, Huntley 2012). Agricultural settlements in marginal areas were abandoned in Britain and continental Europe. Norse settlements were abandoned on Greenland, and the population of Iceland fell by a third by the year 1700 (Lamb 1982). Tremendous storms struck the northern European coast on several occasions, causing erosion and the abandonment of numerous coastal settlements (Clarke et al. 2002). In West Africa, the great empire of Mali collapsed in the late sixteenth century during a period of repeated catastrophic flooding in the Niger valley followed by severe droughts upstream at Timbuktu (Makaske et al. 2007). In India, the recently built capital city of Fatehpur Sikri had to be abandoned for lack of water (Hillel 1991).

In addition to these longer-term shifts in climate has been the influence of the El Niño Southern Oscillation (ENSO) on human well-being. A phenomenon that takes its name from a Peruvian observation that it is often experienced during the Christmas period, ENSO describes a period when prevailing trade winds in the south-central Pacific Ocean weaken, allowing warm surface waters from Australia and Indonesia to migrate eastward to the normally cold-water coast of the Americas (Glantz 2001). ENSO events occur irregularly, anywhere from three to seven years apart, and can last for a matter of months or as long as two years. When they occur, ENSO events trigger significant changes in prevailing weather patterns across much of the globe. Traditionally dry areas can experience heavy precipitation, while typically wet areas can experience drought, and this can have implications for the success of human settlements (Caviedes 2001). For example, Davis (2001) observed that famines that occurred in India during the period of British colonial rule often coincided with ENSO events. The 1998 Yangtze River floods that displaced tens of thousands of Chinese families (discussed in greater detail in Chapter 5) occurred during an ENSO event (Ye and Glantz 2005).

These examples are just a few of many in which large-scale population displacements and migrations have occurred during climatic events of the past (see McLeman 2011a for further examples). However, the simultaneous occurrence of a major

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-107-02265-2 - Climate and Human Migration: Past Experiences, Future Challenges
Robert A. Mcleman
Excerpt
More information

climate event and a significant event in human history does not prove that the former caused the latter. With migration events of long ago our access to details about human systems and local- and regional-scale climate conditions is limited, so it is necessary to be cautious about assuming that climate caused migration, and to consider whether other concurrent events of a political, social, or economic nature may have been more proximate causes, or if it was some combination of all of these. By way of analogy, consider modern-day famine events that have led to distress migration in parts of Africa and Asia. Droughts can serve as catalysts for famine events by causing sudden declines in local food availability and in the incomes of food producers, but typically there is a range of other contributing causes, such as political instability, economic crises, or conflicts that make the population vulnerable to famine in the first place (Watts and Bohle 1993, Maxwell and Fitzpatrick 2012). Sen (1981) demonstrated how even in the absence of a significant downturn in food production people can go hungry because of structural inequities within the political-economic system. So when we see streams of starving refugees pouring across international borders, as is occurring in Somalia as this chapter is being written, to what extent is climate truly the proximate causal factor? After all, droughts are a recurrent and widespread phenomenon in Africa, and other parts of that continent are also experiencing precipitation shortfalls at this moment; why is it that Somalis are fleeing starvation while others are not? Evidently, climatic conditions alone are not determining their fate.

It is worth noting that these historical examples are well-known and dramatic events of a scale that cannot help but capture the attention of researchers. It would be surprising if ruined Viking settlements on the Greenland coast, Mayan temples surrounded by jungle, or the abandoned cliff dwellings of Mesa Verde did not arouse scholars' curiosity. But the reality is that most past events of climate-related migration have undoubtedly gone unnoticed and undocumented, even instances when entire settlements have been abandoned (McLeman 2011a). This is still the case today. Events like Hurricane Katrina grab not just headlines but the attention of scholars interested in environmental migration, even though less spectacular environmental events elsewhere in the United States cumulatively exert a greater force on migration (Gutmann and Field 2010). A solid understanding of how climate and migration processes interact requires an ability to account not only for the spectacular, infrequent event, but also for the more subtle and mundane ones.

1.4 Avoiding Climatic Determinism

In the first part of the twentieth century, a school of thought emerged among geographers that has since been called 'environmental determinism'[4] (Peet 1985). The

[4] Gemenne (2011a) provides a more detailed account of the influence of environmental determinism on present-day research, which is highly recommended.

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-107-02265-2 - Climate and Human Migration: Past Experiences, Future Challenges
Robert A. Mcleman
Excerpt
More information

scholars associated with this line of thinking identified broad trends in human development, conditions, and behavior, and sought to link these with environmental conditions, including climate, in a stimulus-response fashion (Holt-Jensen 1980). Ellsworth Huntington (1907), for example, was one of the first English-language scholars to consider the role of climate in shaping settlement patterns in China. However, in pursuing their ideas, environmental determinist scholars like Huntington, Ellen Churchill Semple (1911), and others developed unsupportable explanations for the linkage between societies and environment. For example, Huntington (1924) created maps comparing national industrial output to global temperature regimes, which showed (probably to no one's surprise) that industrial output was highest in northern hemisphere nations, which also happened to have relatively cool and temperate climates. Through this simple association, conclusions were made that cooler climates made for harder-working people, while warmer climates produced less industrious cultures and lifestyles, ignoring or downplaying social, economic, and political history and events like colonialism and slavery. Later scholars retreated from this sort of logic, and for much of the second half of the twentieth century, research on the role of climate as an influence on human behavior generally, and on migration in particular, became quite rare.

Not until the 1980s, when a new term, *environmental refugees*, was coined in a time of famine-related migration in Africa (El-Hinnawi 1985, Jacobson 1988) did scholars once again turn their attention to the effects of climate on migration. It is not coincidental that this same period was one of tremendous expansion in scientific research on the causes and impacts of anthropogenic climate change. Papers began to appear warning that sea level rise, more extreme storm events, and widespread floods and droughts would displace millions of people worldwide in coming decades (Milliman, Broadus, and Gable 1989; Lewis 1990; McGregor 1992; Myers 1993). The first report issued by Working Group II of the Intergovernmental Panel on Climate Change (IPCC) made similar warnings (Tegardt, Sheldon, and Griffiths 1990). Political scientists working on international security issues picked up on the topic as well, most notably Homer-Dixon (1991), whose work influenced an *Atlantic Monthly* article entitled 'The Coming Anarchy' (Kaplan 1994), which became required reading among senior staff in the Clinton administration (Dabelko 1999; see Chapter 8 for more detailed analysis of the securitization of climate and migration research). Little of this newfound interest in climate and migration came from scholars that had been traditionally engaged in migration research, but instead emanated from other fields like natural hazards, global change, biology, ecology, climate science, political science, and law. To a significant extent this has remained the case until quite recently. A result is that much of what scholars currently know about the relationship between climate and migration has been developed in relative isolation from the theoretical, conceptual, and methodological practices of the broader scholarly field of migration research. To avoid lapsing into a new paradigm of 'climatic determinism' that focuses on the role of climate to

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-107-02265-2 - Climate and Human Migration: Past Experiences, Future Challenges
Robert A. Mcleman
Excerpt
More information

the exclusion of other influences on migration, it is important to knit the theoretically grounded knowledge of migration behavior that has been developed over long periods of time by its specialists with the empirical evidence of climate-related migration that has been generated in recent decades through research in other fields.

1.5 Who Are Climate Migrants Today?

There is presently no mechanism for recording the global number of climate-related migrants and the circumstances behind their movement, and it is unlikely one will be developed any time soon. If it were somehow possible to conduct a census of the global numbers right now, what types of people might be included? The range of possibilities is actually quite broad, and the distinction is fuzzy between someone who might logically be called a climate-related migrant and someone who might not. Obvious people to include in this category would be those forced to relocate following droughts, floods, and extreme weather events of recent years, such as Somalis who fled their homes during the 2011 drought, Pakistanis displaced by severe floods in 2010 and 2012, and residents who left New Orleans and resettled elsewhere in the wake of Hurricane Katrina. Also to be included would be the thousands of wealthy retirees from Canada and the northern United States who retire to the sunny climes of Florida and Arizona each year. True, there are many cultural and economic factors that contribute to that migration, but it is the Sun Belt they seek out, not the Corn Belt or the Rust Belt. These all seem like fairly uncontroversial groups to include in this imaginary climate-migrant census, and they represent extremes from largely voluntary to largely involuntary migrants.

As this impromptu census continues, the enumeration decisions would become more difficult. Take this case for an example. In July 2011, thousands of people were evacuated from Anishnabe First Nation communities in northwestern Ontario, Canada, because of forest fires, and were flown to more southern cities until the fires were extinguished a few weeks later. Let's say the evacuation occurred around the time of our census – should they be included? Since the evacuation was only temporary, probably not; migration, as is seen in the next chapter, implies an evacuation of more-than-temporary duration. But there might be some evacuees whose homes were destroyed and who decided not to return; they should probably be counted. And what about an Anishnabe teenager who, having never been to a southern Ontario city before, falls in love with the bright lights and decides not to go back even once it is safe to do so? Should she be counted? After all, the proximate cause of her having to leave home in the first place was forest fire. What if it turns out that the forest fires were caused by arson and not by the natural, climate-related event of a lightning strike – does that mean all the evacuees should automatically be disqualified from our census? As we start parsing who is a climate-related migrant and who is not, recurring problems of causality and reductionism emerge.

© in this web service Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
978-1-107-02265-2 - Climate and Human Migration: Past Experiences, Future Challenges
Robert A. Mcleman
Excerpt
More information

For the purposes of this book, it is important to be aware that such fine distinctions exist, and that the decision to label someone a climate migrant may have legal and practical implications (see Chapter 7), but it is not necessary to get bogged down in the fine details. In each of the examples just cited – sun-seeking snowbirds, flooded-out farmers, those fleeing drought, and forest fire evacuees – there exists a range of other causal factors for migration with which climatic conditions interact and serve as a catalyst. A simple working description that will be used for the remainder of this book is this:

> Climate-related migration occurs when climatic conditions, weather events, changes in those events and conditions, and/or their physical impacts are among the easily recognizable influences on migration, but they need not be the sole cause of the migration event.

The phrase 'easily recognizable' is used deliberately, knowing there is room for debate over what that exactly means. It is included because many human events, migration or otherwise, when analyzed down to the most minute, tiniest constituents, could reveal some connection to climate. The purchase of a particular house could have been influenced by the breeze felt by the house hunter when she visited it for the first time, or the decision to move to Florida to take a job there may have been influenced by memories of a winter vacation taken there years earlier.

The four clear examples listed earlier share a number of characteristics that are common features of climate-related migration. One is that in each event, there are people who migrated from the place of origin and others who remained behind. Not everyone has fled rural Somalia, not all flooded-out Pakistani farmers abandoned their land, not all wealthy New Yorkers retire to the sun, and most Anishnabe evacuees did go back to their northwestern Ontario homes. In other words, a single climatic event or set of conditions can stimulate a variety of responses among those exposed, some people migrating, others not. As seen in subsequent chapters, even in the case of climate-related migrations involving tens or even hundreds of thousands of people, such as the Great Plains drought migrations of the 1930s and hurricane-related migrations in the Caribbean basin of the past two decades, many more people did not migrate as compared with those that did. This is another reminder to look at migration in the context of adaptation and in the context of what we know about migration behavior more generally, and not in simple cause-effect terms.

Furthermore, a single climatic event can lead to a variety of different types of migration response in terms of duration of the migration, destination, and number of household members participating. In Somalia, some fled to locations within the country, either to other parts of the countryside or to Mogadishu; others fled to Kenya or Ethiopia. In rural Pakistan, some of those displaced by flooding have settled in other rural locations and some have moved to the city. In some cases the whole family has migrated; in others, only certain members have moved to the city in hopes of sending back remittances. Some people displaced by Hurricane Katrina returned to New

© in this web service Cambridge University Press www.cambridge.org