CLIMATE AND HUMAN MIGRATION

There is growing concern that the impacts of anthropogenic climate change will generate large-scale population displacements and forced migration in coming decades. Reports in the popular media periodically conjure up worrying images of millions of 'environmental refugees' flooding into developed countries and cities. Are these concerns well grounded? What is the present state of research and knowledge of the linkages between climate and migration? What might the future implications and priorities be for concerned researchers, policy makers, and the general public?

Robert A. McLeman provides a comprehensive review of how physical and human processes interact to shape migration, using simple diagrams and models to guide the reader through the climate-migration process. While climate change will undoubtedly affect future migration patterns and behavior, the potential outcomes are far more complex than the environmental refugee scenario suggests. This book applies standard concepts and theories used in climate and migration scholarship to explain how events such as Hurricane Katrina, the Dust Bowl, African droughts, and floods in Bangladesh and China have triggered migrations that have not always fit the environmental refugee storyline. Lessons from past migrations are used to predict how future migration patterns will unfold in the face of sea level rise, food insecurity, and political instability, and to review options for policy makers.

This book provides the first comprehensive review of climate and human migration. It will prove invaluable for advanced students, researchers, and policy makers in climate change impact and adaptation studies, migration and demography, geography, environmental studies, environmental sociology, political and public policy studies, and environmental governance.

Robert A. McLeman is a geography professor at Wilfrid Laurier University, Waterloo, Canada; a former diplomat; and an award-winning teacher. He specializes in understanding how the natural environment influences the well-being of households and communities. His research investigates historical drought-related migration on the Great Plains; adaptation to climate change in remote and resource-dependent communities; drivers of modern-day settlement abandonment; and the effects of environmental events and conditions in Africa, Asia, and the Caribbean on international migration to Canada. In writing this book, Dr. McLeman drew his inspiration from years of scholarly research and past professional experiences. His scholarly articles on migration as an adaptation to climate are widely cited, and have featured prominently in reports of the Intergovernmental Panel on Climate Change. Government agencies in Canada, Europe, and the United States have frequently sought his advice on policy issues related to climate change, migration, and security. He is a frequent contributor on environmental issues to French-language and English-language public radio in Canada and the United States, and he enjoys teaching introductory classes in environment studies and engaging the wider public in citizen science.

'McLeman eschews the hyperbole and screaming headlines that often surround this topic to unpack the complex and still evolving connections between climate change and migration. His analysis is both broad and deep in its reach and avoids the pitfalls that commonly plague the climate change and migration literature.'

– Geoffrey Dabelko, Ohio University

'This book is excellent. In *Climate and Human Migration*, Dr. McLeman offers accessible explanations of this tremendously complex association – convoluted processes become understandable. In this way, the book will be valuable in the university classroom. Dr. McLeman also offers a thorough summary of varied literature scattered across multiple scientific disciplines. In this way, the book will be valuable to both social and natural scientists. And finally, with his logical and level-headed approach to a topic that is sometimes presented in controversial and exaggerated terms, this book will be useful to practitioners and policy makers. Highly recommended.'

– Lori Mae Hunter, University of Colorado at Boulder;
Editor-in-Chief of *Population and Environment*

'We've needed this book for some time now. While the "flood of climate refugees" idea (scare?) can have a certain appeal, and its "connect the dots" logic a certain policy utility, Robert McLeman's exceptionally well-researched and readable book reveals we are way off the mark in thinking that the migration repercussions of climate change will be simplistic. *Climate and Human Migration* will be very valuable for research and teaching about the human dimensions of climate change. But perhaps those who need to read it most are the policy makers in various countries who are pondering (and in some cases already formulating) perilous and dangerous policies based on the simple, unelaborated view of how migration and climate change interact.'

– Jon Unruh, McGill University

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Past Experiences, Future Challenges

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For Anna, Coleen, and Sophie

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Preface

Over the past decade or so various sources have produced reports and studies warning that climate change and sea level rise will cause hundreds of millions of people to become environmental refugees in coming decades. One prediction issued in 2005 estimated that by the year 2010 climate change would create 50 million environmental refugees worldwide (thankfully, that prediction proved wrong). Just the same, these concerns have prompted scholars, refugee advocates, and international organizations to call for new policies and laws to protect those whom climate change might displace. National intelligence agencies have commissioned studies of the security implications of climate change–induced displacement, and on two occasions the United Nations (UN) Security Council has held discussions on what ought to be done. UN Environment Programme officials have reported that the Darfur conflict was in part caused by climate change, while the popular media has identified groups living on the Alaskan coast, on Micronesian atolls, and in Africa's Lake Chad region as the world's first 'climate change refugees'. In short, it has become widely accepted that climate change–driven migration will have a significant impact on our future well-being, and for some people it may already be doing so.

I agree that the risks posed by anthropogenic climate change do indeed have the potential to cause large-scale population displacements in many countries. Extreme climate events already do so, as we have seen in recent years through examples like Hurricane Katrina and severe droughts in East Africa. However, the environmental refugee scenario (or more precisely, 'climate change refugee' scenario) is only one of the many ways climate affects migration patterns and behavior, most of which do not make the headlines and do not enter into public discussions about climate change. These include a wide range of diverse examples, a sample of which include: drought-induced changes in marriage-related migration in Ethiopia; influxes of temporary labor migrants to Bangladesh's cities during monsoonal floods; changing pastoralist movements in West Africa; and the ongoing flow of financially secure retirees from the northeastern United States to the Sun Belt. None of these are refugee scenarios. To varying degrees, the migrant in each of these examples exercises some degree of

discretion and control over the duration and destination of migration and, indeed, over the decision of whether to migrate in the first place.

Climate change and sea level rise will have impacts across the whole spectrum of migration, from voluntary to involuntary. It will place some people in refugee-like situations but will create migration opportunities for others. It will make some places more desirable ones in which to live and make others less desirable. It will affect migration within countries and between them. In most cases, future climate-related migration will not unfold as a simple stimulus-response process, where one unit of climate change (however we might measure it) triggers a corresponding additional unit of migration. Rather, migration will be shaped by the interaction of climatic processes with cultural, economic, political, and social processes. How do we know this? Because this is how it already works. A good amount of scholarly research, generated in a variety of disciplines and fields, shows that people exposed to even the severest of droughts, storms, floods, and other climatic phenomena undertake a wide range of adaptation and adjustment strategies, which may or may not include migration. The adaptations they pursue and, if these do include migration, the duration and destinations they select, are shaped by access to social networks and to financial resources, cultural heritage, the freedom to migrate legally, and a whole host of other factors that may have little or no direct connection with climate.

My motivation for writing this book is straightforward. If we are to better understand how climate change will affect future migration, to produce reliable forecasts of that migration, and to formulate sound plans and policies at national and international levels, it is important that we base our considerations on a well-grounded understanding of how climate influences migration patterns and behavior more broadly. This requires thinking beyond the speculative climate change refugee scenarios and avoiding normative prescriptions for action that are not based on empirical evidence (of which there are already more than enough in circulation). Just as no one would seriously contemplate making international monetary policy on the basis of back-of-the-envelope calculations of worst-case scenarios, national and international migration policies will not and should not be made on the basis of unproven fears and untestable guesstimates of environmental refugees. We need reliable empirical research grounded in a sound understanding of the physical processes of climate and the human processes that influence migration. Generating this will require natural scientists to become more engaged with social science research on migration; social scientists will need to become better versed in the basic physical science of climate; and policy makers and policy influencers must become more familiar with both.

As a contribution to this end, this book provides a state-of-the-science introduction to the subject of climate and migration; at least, as good as I can muster. It starts with the basic premise that climate-related migration is neither a simple stimulus-response process nor an unknowable set of chance outcomes. Instead, it treats migration as an outcome of a larger set of processes by which individuals and households adapt not

only to climate itself, but to the interaction of climatic events and conditions with cultural, economic, political, and social processes. I use as a shorthand for this the 'MESA' function, suggesting that migration (M) under conditions of climatic variability or change is a function of the particular climatic conditions to which a given population is exposed (E), its relative sensitivity (S) to such conditions, and the available adaptation (A) options other than migration. I am very conscious of scale here, recognizing that both climatic and human processes play out in different ways over different spatial and temporal scales. Instead of broad-brush assertions about how the MESA function plays out on the ground, I supplement it with a simple process diagram of how migration emerges within an adaptive human-environment system, with household access to capital helping the system generate particular migration outcomes (don't worry, it will make sense by the time you reach it in Chapter 3 at Figure 3.9). The connections and flows shown in the diagram are reinforced by applying it to known examples of climate-related migration, thereby teeing up the final chapters in which future challenges are discussed using the same language and concepts. Although the nonacademic reader may at times find the large number of citations distracting, the book is deliberately and thoroughly referenced so that it might serve as a one-stop shop for readers who desire no more than a single resource, while simultaneously pointing out promising next directions to those who want to plunge into the subject in much greater depth.

The book has three general sections. Chapters 1 through 3 provide the theoretical, conceptual, and methodological backdrop for a contemporary study of climate and migration. Chapter 1 gives a general overview of how the subject has been approached in the past and the directions in which research is currently moving. Chapter 2 reviews the broad scholarly field of traditional migration research and introduces the key concepts and theories used in it. Chapter 3 reviews the theories and concepts used in climate impacts and adaptation research. It combines them with those introduced in the preceding chapter to provide a systems-based approach to understanding how migration patterns emerge and are modified as vulnerable populations adapt to climatic events, variability, and change.

The second section of the book – the 'past experiences' referred to in the subtitle – applies the theories, concepts, and approaches from the first section to specific examples of climate-related migration. These are organized according to the three types of climatic events most commonly associated with migration: extreme weather events (Chapter 4), floods (Chapter 5), and droughts (Chapter 6). Each of these chapters follows a similar progression. It begins with an overview of the physical processes that give rise to the event in question, keeping in mind that the reader may not have a strong grounding in the natural sciences. It next identifies the cultural, economic, political, and social processes that put people in positions where they are exposed to such events and describes the range of adaptations that may be undertaken by those exposed. Some of these may be initiated at the community, household, or individual

scale; others require action by higher-level organizations and institutions. Each chapter then focuses on the various shapes and forms migration can take as people adapt to the climatic event in question, using examples drawn from across the globe. Each chapter in the second section concludes by exploring in detail well-known examples like flooding in Bangladesh, the Great Plains Dust Bowl, and Hurricanes Mitch and Katrina and drawing generic lessons from them.

The final section of the book takes the lessons learned from earlier chapters and applies them to future challenges. Chapter 7 considers the potential impacts of mean sea level rise on migration and examines the strengths and weaknesses of existing and proposed national and international regulatory frameworks for managing future climate-related migration. Particular attention is paid to issues of statelessness that could conceivably emerge from this dynamic. Chapter 8 considers the security dimensions of climate-related migration in terms of international political stability and in terms of food security, and in doing so identifies much-needed areas for future research. The chapter and the book itself conclude with a discussion of how even though we may not know precisely how climate change will play out in the future, and even though climatic events will undoubtedly occur that catch us by surprise, we know enough from present-day experience to anticipate how migration behavior and patterns may respond.

I began writing this book in 2011 and finished in early 2013, but the thinking that went into it began twenty years ago, when I was living and working in Hong Kong. At that time I was working for the Canadian foreign service at my country's diplomatic mission there, while simultaneously taking my Master of Science degree at the University of Hong Kong. My master's dissertation, which attempted to combine the environmental science I was learning in school with what I was learning about migration during my day job, was entitled 'A management strategy for potential human population movements as a result of climate change'. When I flip through it now, its crudeness and quaintness make me smile. Still, I wish I had attempted to publish it then, for it would be more than a decade before I published my first scholarly article on the subject (McLeman and Smit 2006a). In the meantime, I continued taking diplomatic postings, specializing in many different aspects of international migration, including interviewing refugees in Kosovo; helping skilled workers travel to Canada under the North American Free Trade Agreement; training airline staff to spot migrant smuggling; and, generally interacting with migrants and people who work with migrants on a daily basis. By the time I gave up foreign service to do my PhD, I had asked close to ten thousand people their motivations for wanting to go to Canada to visit, study, work, or live permanently.

I never met anyone who said they wanted to move to Canada because of climate change (granted, I never specifically asked that question). Most people were motivated by the sorts of things you might imagine: a desire to be with friends and relatives, to work, to pursue economic opportunities or a higher education, or because

they did not feel safe or secure in the place where they presently lived. I did, however, regularly meet people who said they were seeking the clean air and natural environment in Canada; usually these were people who lived in congested or polluted urban areas (I wonder if those migrants who have since been stuck in a Toronto traffic jam feel the same way now). One example sticks out in my mind. Back in the early 1990s, I was interviewing a young Taiwanese couple with a son about ten years old. When I asked them why they wanted to leave Taiwan, they answered 'the environment'. Now, that particular week China was rattling its sabers at Taiwan and threatening to invade it. This happened regularly back then, and occasionally still does when China thinks its tiny cousin is getting too big for its britches. In any event, given the headlines and the context of our preceding conversation, I thought they meant the political environment. When I rephrased the question to ask why they wanted to move to Canada, I got the same answer: the environment. As I started to clue in, the couple explained that their son was asthmatic and that the air pollution was awful in Taipei (as I had experienced on a recent visit there). They had been to Vancouver for a family vacation, and found their son could breathe more easily there, and that had motivated them to migrate to Canada. In other words, they were environmental migrants, but not environmental refugees.

My point in concluding this preface with this story is that environmental factors (and climatic events would be one subset of these) can, and sometimes do, influence migration, but the influence may be subtle and not obvious to the outsider. The causality behind any migration decision is complex, and so even though in this book I speak in terms of general behaviors, interactions, patterns, and trends, migration is for the most part a decision made by individuals and households for reasons particular to their personal circumstances.

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While my name appears on the cover, many others made this book possible. First and foremost, without the support and encouragement of my wife, daughters, and extended family, I could not have written a word. Through my empirical research I have had many great friends, supporters, and collaborators. My knowledge of and continued fascination with the Dust Bowl migration is the direct result of help received from Doris Weddell, Earl Shelton, and Ray Rush of Kern County, California, and from the Rider family, Earl Strebeck, and the late Dick Mayo of Sequoyah County, Oklahoma. Had I not already promised my daughters the dedication, this book would have been dedicated to Mr. Mayo. The people of Herbert, Saskatchewan, Geoff Cunfer, and Simon Evans, have also taught me much about migration on the Great Plains. The good people of Addington Highlands and North Frontenac are thanked collectively; too many of them have supported my research over the years to be named individually.

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Fussell provided detailed comments on earlier drafts. Peter Todd did the original cartography for maps found in this book, and they look sharp.

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Not being sure where in this list to put him, so James William Buffett is thanked here.

The final and most important acknowledgment goes to you, the reader. I hope what you find in the following pages is worth the time you spend looking at it, even if you end up not agreeing with how I've represented the subject. If you are a student reading this book, whether by choice or because some professor forced you to do so, I hope it inspires you to pursue your own research in this area.