NEGOTIATING CLIMATE CHANGE IN CRISIS

EDITED BY STEFFEN BÖHM
AND SIAN SULLIVAN

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Cover design by Anna Gatti

6. Climate Migration Is about People, Not Numbers

D. Durand-Delacre, G. Bettini, S. L. Nash, H. Sterly, G. Gioli, E. Hut, I. Boas, C. Farbotko, P. Sakdapolrak, M. de Bruijn, B. Tripathy Furlong, K. van der Geest, S. Lietaer and M. Hulme

It has become increasingly common to argue that climate change will lead to mass migrations. In this chapter, we examine the large numbers often invoked to underline alarming climate migration narratives. We outline the methodological limitations to their production. We argue for a greater diversity of knowledges about climate migration, rooted in qualitative and mixed methods. We also question the usefulness of numbers to progressive agendas for climate action. Large numbers are used for rhetorical effect to create fear of climate migration, but this approach backfires when they are used to justify security-oriented, anti-migrant agendas. In addition, quantification helps present migration as a management problem with decisions based on meeting quantitative targets, instead of prioritising peoples' needs, rights, and freedoms.

Introduction

Perhaps counterintuitively—in a volume calling for actions to tackle the climate crisis—this contribution cautions against the casual use of one of the primary narratives through which the climate crisis is signified and urgent action invoked. That is, the dramatic estimates and projections of a looming migration crisis caused by climate change. We problematise the numbers through which the spectre of such a crisis is supported and

communicated. Our critique of these numbers takes place on several levels. We begin by pointing to the many methodological challenges in producing robust numbers. Estimates remain imprecise and highly uncertain, despite some significant developments in methods and datasets. We also diagnose more fundamental epistemological issues about the *kinds* of knowledges required to understand the climate-migration nexus. Numbers and quantitative estimates fail to capture crucial dimensions of human mobility. Migrants' decisions to move can be forced but also voluntary, are highly subjective, and need to be understood as situated, political, and non-deterministic.

Ultimately, however, our concern has less to do with what numbers can or cannot tell us about climate migration than with the ways in which numbers are (mis)used. On the one hand, a focus on mass migration numbers is intended to construct climate migration as a *crisis*. However, framing this crisis as a humanitarian issue has done little to protect migrants and more to stoke the fires of anti-immigrant populism, providing arguments for more stringent border controls and increasingly restrictive migration policies across the Global North. At the same time, the promise of quantification creates the impression that this crisis can be clearly defined, and *managed*, as long as better numbers are made available (also see Hannis, this volume). Attempts to use numbers to address issues of climate justice and responsibility are undercut by the focus on quantification itself, which tends to limit debates to technical questions about how many will move and how this movement can be organised.

This critique of headline estimates should not be misinterpreted as a denial of the impacts that climate change is having and will continue to have on peoples' mobilities. Climate change impacts related to sea-level rise, drought, increased frequency of wildfires and storms—and the associated declines in livelihoods—pose serious and differentiated challenges with which we must contend (as also highlighted by Lendelvo et al., this volume). Rather, our aim is to point to how a focus on numbers reduces political imaginaries of our response to climate migration to a narrow range of possibilities. We argue that a different approach is needed.

A Brief Overview of Climate Migration Numbers and their Methodological Limitations

The environmentalist Norman Myers (1934–2019) initiated efforts to estimate the impact of climate change on migration when he predicted in the early 1990s that there would be 150 million "environmental refugees" by 2050 (Myers 1993). He later updated his estimate to 200 million by 2050 (Myers and Kent 1995; Myers 1997, 2002). The latter figure remains one of the most widely cited climate migration numbers to date. Myers' estimations were based on linear extrapolations of demographic and displacement figures in what he considered "environmental hotspots". These methods were rapidly challenged as too simplistic, notably because they assumed a linear relationship between environmental impacts (such as sea-level rise or desertification) and out-migration from affected areas. They were also not based on any actual inquiry into the causal mechanisms involved and ignored potential *in-situ* adaptation strategies. Myers' approach relied on aggregate global forecasts, rather than specific case studies that could bring empirical grounding to these assumptions (Black 1994, 2001; Suhrke 1994; Castles 2002). Myers' numbers have been reproduced in many prominent reports since their publication (as critiqued by Saunders 2000). More recently, numbers larger than a billion people have also been disseminated in academic articles, NGO or think tank reports, and the press (see Table 1). Myers himself later admitted that coming up with the final estimates required "heroic extrapolations" (Brown 2008).

Despite this situation, many subsequent reports—mostly published by NGOs and (inter)governmental organisations—either reproduced Myers' numbers or provided other estimates based on analogous methods (see methodological notes in Table 1). These numbers are rounded to the nearest ten or hundred million, an indication of the crude methods employed to derive them. Most problematic is the prevalence of simple additions of annual figures and an extrapolation of such trends into the future, which can produce nothing other than a continuously rising graph (for a recent example, see Institute for Economics and Peace 2020).

Estimated number of migrants due to climate change (upper range)	Time period	Source	Notes on methodology
10 million	-	Jacobson 1988	Terminology: "Environmental refugees"
150 million	2050	Myers 1993	Terminology: "Environmental refugees" Geographical focus: both internal and international (specifically: Bangladesh, Egypt, China, India, other deltas and coastal zones, island states, and "agriculturally dislocated areas")
200 million	2050	Myers 1997, 2002; Myers and Kent 1995	Updated estimate based on Myers (1993).
250 million - "at least 1 billion"	2050	Christian Aid 2007	250 million number based on an interview with Norman Myers. Terminology: "people forced from their homes", "forced migration" Geographical focus: both internal and international
200 million	2050	Friends of the Earth 2007	Direct reference to Myers (1993) and updated figures.
150–200 million	2050	Stern 2007	Direct reference to Myers and Kent (1995).
200–250 million	2050	Biermann and Boas 2010	Direct references to Myers and Kent (1995) and interview with Myers in Christian Aid (2007).
250 million	2050	CARE Danmark 2016	Refers to Christian Aid (2007) interview with Myers as latest estimate.

Number	Source	Year	Details
1.4 billion	Geisler and Currens 2017	2060	Spatial vulnerability model exploring the impact of global mean sea-level rise (SLR) on coastal settlements. Mentions Neumann et al. (2015) as the source for 1.4bn people exposed to SLR. Terminology: "climate migrants" Geographical scope: global, in low elevation coastal zones
"millions or even billions"	Environmental Justice Foundation 2017	-	Cites Geisler and Currens (2017) as a source. Terminology: "climate refugees" Geographical scope: international and internal
143 million	Rigaud et al. 2018 (Groundswell Report)	2050	State-of-the-art gravity model of climate migration. Terminology: "internal climate migrants" Geographical focus: Sub-Saharan Africa, South Asia, Latin America
1.2 billion	Institute for Economics and Peace 2020	2050	Terminology: "people at risk of displacement" Geographical focus: forty-three countries

Table 1. Commonly cited climate migration numbers. This table is far from exhaustive but captures some of the more prominent and commonly cited examples. Sources: Authors' review (drawing on Brown 2008; Gemenne 2011; Ionesco et al. 2016; Luetz 2019).

Recognising the deep flaws in the methods employed to derive these numbers, quantitative social scientists and modellers have sought to develop more sophisticated datasets and methods to improve the credibility of numerical estimates. In doing this, they contend with the unavailability of data, particularly at small scales or in disaggregated form, its poor quality, and its limited comparability (Brown 2008; Tejero et al. 2020). On the condition that the necessary data could be gathered, reviewers of the field have repeatedly emphasised the need for more longitudinal studies, a multi-scalar research, analysis disaggregated along gender, age, ethnic, caste, and class lines, and consideration of a wider range of environmental drivers beyond precipitation changes or sea-level rise (Brown 2008; Piguet 2010; Obokata et al. 2014; Vinke and Hoffmann 2020).

As a result of these responses, some refinements to datasets and methods have been made. Most researchers also now present overall climate migration numbers with much greater care than was the case for earlier estimates. They largely acknowledge limitations and warn readers not to overinterpret results by pointing to numerical ranges and associated uncertainties. Nonetheless, reviews and meta-analyses of quantitative studies still conclude that many analytical problems persist. They find that models allow few confident causal claims about the environment's influence on migration except "in broad terms and at fairly large spatial scales" (Obokata et al. 2014: 127); and that results remain heavily influenced by the methods used. Ultimately, they find it remains exceedingly difficult for modellers to defend any single factor as the primary driver of migration (Piguet et al. 2011; McLeman 2013; Obokata et al. 2014; Beine and Jeusette 2018; Cattaneo et al. 2019). In other words, it remains extremely difficult to definitely link migration to climate change.

A Greater Diversity of Knowledges of Climate Migration Is Needed

In addition to these methodological shortcomings, a focus on climate migration numbers obscures the need for other forms of knowledge about the climate-migration nexus. Producing these knowledges requires more use of mixed and qualitative methods. These are better

suited than quantification alone to study the multi-causal, highly situated, and subjective dimensions of climate migration. Attempts to isolate migration drivers related to climate change, and to identify and count 'climate migrants', are at odds with most social scientists' understanding of migration. From a social science perspective, human mobility is well-accepted to be a multi-causal and complex phenomenon. This implies that migration drivers—be they social, political, economic, environmental, or demographic—interact with and mutually influence each other (Black et al. 2011).

Our trouble with numbers is also motivated by fundamental questions on how migration itself should be understood. Attempting to reduce migration to a number is akin to the "migration map trap" whereby individual experiences of migration become "faceless pixel[s] in a big threatening arrow" (Van Houtum and Bueno Lacy 2020: 210). This approach not only overlooks the situated complexities already highlighted, but also obliterates the important subjective dimensions of migration.

To be clear, accounting for those subjective dimensions is not merely about looking at the faces behind the numbers. The problem with this methodological 'reversal' would be to individualise processes that are in fact emergent and collective, thereby interpreting peoples' experiences and extrapolating singular stories as representative of millions. Rather, we suggest that it is important to fully acknowledge that mobility itself is a cultural construct, and that distinct ontologies and epistemologies of mobility are embodied in and inform migrants' choices and experiences (also see Sullivan Chapter 3, and Dieckmann's chapter, this volume on the relevance of ontological concerns for situating choices and understanding). This subjective dimension of migration stresses its non-deterministic character and, in line with a general shift in migration studies, calls into question the dominant focus on 'root causes' and migration 'management'. Viewing migration and mobilities as autonomous (which is not a synonym for voluntary or individual) practices suggests that they must be investigated well beyond institutional constraints and categories (De Genova and Peutz 2010; Mezzadra and Neilson 2013; Scheel 2013).

In practical terms, we are calling for approaches that engage with the subjective diversity of migrant mobilities and situate people involved

and their perspectives more prominently in the research process (Casas-Cortes et al. 2015). This orientation requires deep qualitative work—usually based on interviews and ethnographic fieldwork—and a general move away from an emphasis on legal and governmental frameworks and the economic determinism of the labour market.

A Climate Mobilities Approach to Diverse and Situated Mobilities

A climate mobilities approach is a promising way to understand the mechanisms behind the decision to migrate (or to stay) (Boas et al. 2019). This approach, based largely on qualitative research, does not aim to cut through causality and isolate 'the environment' from other 'contextual' factors, or to identify the dominant factor in migration decisions. Instead, it considers causation as always multi-faceted, situated, and nonlinear. The changing climate remains a relevant factor, but climate only exerts its influence on the world through the matrix of social, economic, environmental, cultural, historical, and political processes that comprise the social world (Hulme 2011). In this way, the climate is not privileged as an influence on mobilities but is also recognised as a pluralistic phenomenon worthy of multi-pronged empirical investigations.

These investigations need to be pursued using a rich vocabulary capturing the many nuances and forms that (im)mobilities take. Indeed, social science research has shown that climate mobilities can be short-term or long-term, but also circular or seasonal (Zickgraf 2018). What may start as a short-distance, temporary move can turn into a long-distance, permanent one (Van der Geest 2010). Some people choose to remain in their homes in full cognisance of the risks involved (McNamara and Gibson 2009; Adams 2016; Ayeb-Karlsson et al. 2016; Farbotko 2018), while others are trapped and experience involuntary immobility (Black et al. 2013), or embark on long-distance movements because everyday short-distance mobilities to markets or healthcare are disrupted (Blondin 2020). In addition, it is crucial to understand the situated dynamics and local contexts in which migration (or immobility) occurs. Socio-cultural, political, and environmental dynamics change

from place to place, and can differ significantly even within a single community.

To better understand the complexity of migratory movements, we can also turn for example to "trajectory ethnographies" (Schapendonk and Steel 2014; Schapendonk et al. 2018), "geographies in and of movement" (Brachet 2012), or life history approaches (Singh et al. 2019). These in-depth approaches study how mobility unfolds, what shapes it, and how mobility decisions are made. The first two involve interviews in multiple locations, at different moments and stages relevant to a journey, while the latter explores personal narratives of mobility. Such methods provide a detailed picture of the circuitous routes people take; of the obstacles, meetings, and separations that punctuate them; and of peoples' perceptions, aspirations, and memories.

Of course, such methods also have their limitations. Questions can be raised about the power dynamics between researchers and research participants, and the latter's degree of representation (Cabot 2016; Khosravi 2018; Boas et al. 2020). Can we—as often privileged academics—really put ourselves in the shoes of affected individuals? Trajectory approaches allow researchers (to some degree) "to practice mobility and to reveal mobility-immobility relations that otherwise would remain hidden", but it is important to stay reflexive (Boas et al. 2020: 144).

This is not to say that better numbers cannot be produced in the course of estimating climate change and migration interconnections. Besides improving quantitative methods and data, however, we argue that progress will only be achieved through greater collaboration with qualitative social sciences of the kind just described. We see as promising the mixing of methods in work that 'grounds' big data with site-based fieldwork, so as to challenge assumptions made from afar and detect important dynamics that big-data research would otherwise miss (Boas et al. 2019). Collaborative work integrating behavioural migration theories and concepts of "place attachment" into agent-based models is also helping to increase the sensitivity of model results to variations in individual and community-level responses to environmental hazards (Adams and Kay 2019). Lastly, the recent uptake in mobilities research

of tools such as Q methodology[1] also reveals a range of shared subjective understandings, attitudes and perceptions of climate change and human mobility (Van der Geest et al. 2019; Oakes 2019).

The Misuses of Climate Migration Numbers

If we insist on epistemological and methodological diversity beyond quantification alone, it is because social science studies on numbers—not just of climate migration but in other spheres too—have repeatedly shown their potential for misuse (Porter 1995). The point is not to do away with numbers, but to exercise caution at all stages of their production, communication, and use. Below we detail two specific areas of concern.

Climate Mobility Is Not a Crisis

Our first concern with headline numbers is how they are used to construct climate migration as a *crisis*. The intention behind such rhetoric may be laudable: to stimulate action on climate change and to assist its victims. But there are many problems with using fear of mass displacement as a rallying cry. There is absolutely no guarantee that crisis narratives underpinned by large numbers are an effective way to achieve these aims.

On the contrary, press releases and the news media tend to highlight a single number, usually drawn from the upper range of estimates presented in the original source. In some cases, the numbers lose all specificity, with headlines pointing only to 'millions' or even 'billions' of people on the move (also see discussion of the constructed and historical dimensions of 'environmental refugees' in Saunders 2000). Sometimes, they do not even refer to a specific source. In such a discursive context, the specifics of the number and the underlying

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1   The aim of Q methodology is to identify the shared views of study participants on a given issue. Participants are asked, as a group, to rank a set of statements on a scale from "strongly disagree" to "strongly agree". The statements are selected to be representative of known existing opinions on the issue. In addition, participants are asked to explain their decisions, providing qualitative commentary to the quantitative sorting exercise.

methodology matter little, as long as it is high. Numbers are used to rhetorical effect.

The dystopian futures thus created are often associated with a tendency to discuss migratory flows in hydrological metaphors, such as in assertions of 'waves', 'floods' or 'rising tides' of migrants. Such invocations connect with a wider racist motif that contributes to an alarming imaginary wherein the 'Global North' will be overwhelmed by migrants from 'Global South' contexts (Bettini 2013; Methmann 2014; Pallister-Wilkins 2019). Worse still, the 'hotspots' approach on which these narratives are based tends to erase colonial histories and naturalise structural violence, neutralising local contexts and conditions. By reducing large parts of the Global South to a "hotspot", this perpetuates a dangerous othering exercise, denigrating large parts of the world as merely disaster-ridden, dangerous, overpopulated places from which people can only aspire to flee (Giuliani 2017). This narrative actively reproduces the figure of the climate migrant as a security threat, and ultimately, as a highly racialised entity (Baldwin 2013).

Researchers who seek to publicise their work on the climate-migration nexus must grasp these racist and simplifying dangers, as too should policymakers, practitioners, and journalists who promote these narratives. We argue that the stories of affected people ought to be central in such reporting, even if—perhaps especially if—their stories run counter to our intuitions and estimated numbers. It is people who matter, not numbers.

Climate Mobility Is Not a Management Problem

The promise of better numbers also reinforces the impression that the climate migration crisis can be managed *because* it can be quantified. Numbers hold a privileged place in contemporary political discourses and policymaking, as they are associated with rigour and objectivity in the public and scientific imagination (Porter 1995; Espeland and Stevens 2008; Hansen and Porter 2012). Migration policy has not escaped this trend. To a large extent migration expertise is understood to be associated with researchers' ability to quantify their findings, so they can be used in managerial practices that place statistical methods at the

centre of decision-making (Takle 2017). While numbers have their place in policymaking, we argue that the qualitative methods and subjective perspectives highlighted above should be centred in policymaking on climate mobilities. This will only be possible if the rhetorical power of numbers is acknowledged and challenged.

Adopting a managerial approach to climate migration, guided by flawed numbers, risks disregarding many of the dangers associated with climate migration numbers discussed above. This practice can be understood in terms of "strategic ignorance". While policymakers are widely aware of migration data quality issues, and associated uncertainties, they still maintain a picture of migration as an "easily measurable, intelligible reality" that can therefore be managed by numbers (Scheel and Ustek-Spilda 2019). In this way, they avoid the difficult political questions—notably around responsibility—that a more head-on engagement with migration's complex realities would require (Betts and Pilath 2017; Kelman 2019).

In a political context where critical migration scholars struggle to make themselves heard, this situation is particularly concerning. Mobilities scholars often find that while many policymakers are willing to engage in discussion, these exchanges do not have any meaningful bearing on policy design (Baldwin-Edwards et al. 2019; Héran 2020). Researchers have even expressed concerns that findings of the migration research funded by the EU are disregarded by the EU's own policy processes (Kalir and Cantat 2020). In this light, the constant drive under migration management processes for "more and better data" can have the counterproductive effect of ignoring already well-established knowledge in migration research—whether quantitative or based on other methods.

Conclusion

Estimates of climate migration numbers present a facade of objective, authoritative and unemotional facts. But these numbers are highly contentious. Such estimates need to be recognised as being grounded in normative, epistemological and methodological assumptions which are often hidden and rarely challenged. At the very least, migration scholars

should expose these assumptions so that audiences better understand how migration numbers are constructed (for a recent example, see McMichael et al. 2020). In many cases, the estimates of people moving in the context of climate change are methodologically questionable or else nebulous.

Migration numbers need to be understood against this background. But they also do not stand alone. They are attached to various narratives and are presented in multiple ways. Even rigorous, cautiously communicated estimates can become decoupled from the complexities of human mobilities. The significance of a discourse is not simply about how it is constructed, and by whom, but also lies in how the discourse is received, and how the narratives which package migration numbers are filtered and interpreted. Complexities that may initially be presented alongside the numerical estimates become erased. Numbers alone become the headline, thus distracting from important political questions about humanity, justice, and responsibility.

A common narrative with which climate migration estimates are coupled (either by their authors or during their reproduction and dissemination) is one that conceptualises human mobility in the context of climate change as a crisis. The large numbers of people imagined to be on the move are employed to signify the looming crisis and used to invoke urgent action. There comes a point where these numbers are instrumentalised by political movements whose values— expressed in xenophobic narratives and anti-immigrant agendas—are at odds with those who champion these numbers to call for bolder climate action.

The relationship between climate change and human mobility should not be seen as a security problem, as a managerial issue, or as a number to be controlled. The policy focus should be on people—their vulnerabilities, rights and freedoms—so as to help prise open political spaces for policy interventions beyond building walls, real or rhetorical, designed to control rather than to care.

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