Abstract: The question of how migration patterns will be influenced by environmental and climate change has received much attention within policy and academic circles. This focus can be explained in part by fears voiced by an alarmist group of migration scholars regarding uncontrolled population movements over country borders at the hands of a changing climate. This chapter explores the undercurrents driving widespread interest in the interaction between climate change and migration. In so doing, it explores how narratives around migration have been shaped by the use of certain terminology or ways to define, theorise, facilitate and problematise the movement of people. Current understanding of the interactions between the environment and human migration are characterised by a high degree of complexity and uncertainty. A wide range of methods and theoretical frameworks have thus been developed that seek to expand our understanding of its dynamics. Despite methodological and conceptual advances within the field, we propose that future research and policy must consider the loaded nature of language and the ways in which terms such as ‘climate change’ and ‘migration’ are interpreted. Care must be taken to ensure that the development of actions and policy initiatives truly serve to protect and benefit affected people, whether they are on the move, have arrived in a new destination, or are immobile and want but are unable to move.

Key words: behavioural studies, climate change, decision-making, environmental migration, immobility, risk perception, uncertainty

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Environmental migrants, climate ‘refugees’ and sun-seeking expats

Capturing the larger context of migration in a changing climate through appropriate and effective behavioural research

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Climate and migration narratives

The last 10–20 years have seen an explosion of interest in academia and policy around how migration patterns might evolve with environmental and climatic change (e.g. Foresight 2011; Graeme et al. 2012). This interest begs the question ‘why environmental change and migration should be of particular concern?’ — especially given the widespread recognition of the overriding importance of other non-environmental factors in determining migration flows, such as economic disparity and relationships with other global transformations such as development.

One supposition around the popularity of the environmental change and migration discourse is that the issue combines two societal preoccupations: climate change and migration. Alternatively, at a deeper political level, it may be that both migration and environmental change speak to tensions around state control, power (or lack thereof), and an inherent fear of exogenous influences. More likely it relates to the mainstreaming of fears of the estimated hundreds of millions of ‘environmental refugees’ predicted to occur by 2050 as far back as the 1980s and 1990s (El Hinnawi 1985; Jacobsen 1988; Myers 1993; Myers and Kent 1995).

While there is currently no refugee status for those forced to move across borders[1] due to environmental or climatically[2] related events (Gemenne and Brücker 2015), a repeated, and thus reinforced, narrative has emerged that sees climate change as likely to result in the mass displacement of populations. Further development of this narrative supposes that displaced people will gravitate up environment gradients to countries and places of relative prosperity and environmental safety. Against this supposition is the observation that past empirical work (e.g. Lu et al. 2016a; Ayeb-Karlsson et al. 2016) suggests that, rather than travelling large distances and across borders, those displaced by natural hazards tend to move short distances and for short periods of time, and even to locations of greater environmental exposure and sensitivity.

There are, however, notable exceptions to this general rule. One oft-quoted example in this regard is the narrative around the European manifestation of the Syrian crisis in 2015 (Kelley et al. 2015), although this is not without its critiques (Selby and Tadros 2016). In this example, it has been argued that the mass migration from the Syrian countryside to cities was linked to an exceptional five-year drought, statistically attributable to anthropogenic global climate change (Kelley et al. 2015). In turn, the Syrian government’s failure to adequately provide for those internally displaced people then led to conflict and mass displacement internationally, triggering the European element of the crisis. Ignoring whether conflict is associated with climate extremes, there remains the issue that environmental threats are unlikely to calm any conflict related movements of people and future research might focus on where future environmental hazards spatially co–exist with regions prone to conflict and containing vulnerable populations.

Another issue to bear in mind is the power of language when talking about sudden ‘mass’ movements of populations. In particular, one needs to think critically about the origins and

meanings of phrases used to describe migrants and mass migration. For example, who is described as a migrant? In many policy and media circles, ‘mass migration’ is not necessarily defined by the number of people moving, but rather who is moving and where they are moving to. When, for example, 300,000 British ‘expat citizens’ move to Spain, commentators do not describe them as ‘migrants’ or their movement as a ‘mass migration’.[3] In contrast, when around 300,000 people from Syria applied for asylum in the UK in 2015, references were made to a ‘migrant crisis’ and ‘uncontrolled mass migration’.[4] Baldwin (2016) argues that climate change and migration discourses are currently reproduced in a manner where: (1) climate change induced migration is proposed to be not yet taking place but will occur in a distant future; and (2) post-colonial framings shape ideas relating to the nature of the locations and the individuals that will be affected by climate change or will migrate due to climate change.

Another argument against those positing that the world is likely to be swamped by millions of environmental refugees is that the very foundation of this argument relies on an unsubstantiated assumption of immutable limits of adaptation being breached forcing migration. This is despite the acknowledgment of the socially constructed nature of limits to adaptation which is supposed to be driving migration. For example, it has been argued that limits to adaptation are as much a function of ethics, knowledge, attitudes to risk, and culture as they are defined by immutable biological, environmental or technological thresholds (Adger et al. 2009).

Reflecting on the question of why there is so much modern interest in environment and migration suggests to us that future research within this arena should probably ask: (1) what (or who) is driving the interest in the interaction between environmental change and migration; and (2) how has this shaped the way that we think about the terminology used and the ways we

define, theorise, facilitate and problematise the movement of people in the context of a changing climate?

Coping with seemingly insurmountable uncertainty

Uncertainty is a key characteristic of the environment and migration nexus, in terms of both our understanding of the interactions between environmental change and migration now and how we anticipate they will evolve in the future. Uncertainty is endemic to our understanding of future climate change in terms of unknowns around natural variability, climate processes, greenhouse gas and aerosol emission pathways, and model uncertainties. For example, in terms of natural variability, we have a decided lack of ability to predict volcanoes or solar variability (both of which influence the climate) with any accuracy at long lead times. Indeed, differentiating current knowledge claims around climate change is best summarised according to whether they may be classified as ‘known-knowns’; ‘known-unknowns’ or ‘unknown-unknowns’ (e.g. Donald Rumsfeld).[5] The ‘known-knowns’ of climate change for many parts of the world are limited to the generalities that temperatures, rain intensities, atmospheric carbon dioxide levels, ocean acidification and sea levels will all increase. By contrast, for much of the world the jury is still out on whether the future will see an anthropogenic climate change induced increase or decrease in rainfall.

If our knowledge of future climate change is uncertain, then our understanding of human responses to environmental pressures on livelihoods and lives is at best superficial. The interactions between climate change and socio-ecological systems include considerable uncertainty with regard to how people perceive and respond to climate change impacts (Streets

and Glantz 2000), or how they find safety and certainty within the uncertainty they face (Fox et al. 2017). There is a general assumption within academia and policy that people will try to escape or move away from environmental stressors and shocks as long as they have the ability to do so. However, this supposedly ‘rational’ response to stresses and shocks has been shown to not always determine a person’s behaviour (e.g. Mitchell 2010; Stephens et al. 2013; Oakes 2014; Morrison et al. 2015). Increasingly, the assumptions of economic and bounded rationality are being challenged (e.g. World Bank 2015). As stated previously, risk perceptions are known to be heavily influenced by social and cultural values that may impede limits to adaptation for different reasons. For example, religious beliefs and social attitudes strongly influence people’s mobility and immobility, so that praying more may serve as a more rational response for some individuals if they believe that the disaster befalling them is God’s punishment (Krüger et al. 2015; Ayeb-Karlsson et al. 2017).

Understanding the many manifestations of (im)mobility

The concept of ‘Trapped Populations’ was brought into contemporary thinking by the UK government’s Foresight: Migration and Global Environmental Change (MGEC) Report (Foresight 2011; Black et al. 2011). Trapped Populations are proposed to be those impoverished people that face a “double set of risks” (Foresight 2011: 14) by being both unable to move away from environmental threats and especially vulnerable to their impacts, especially in “urban areas [of low-income countries] that are particularly vulnerable to environmental change” (Foresight 2011: 201).

However, despite its conceptual importance as an opportunity to protect those people most affected by environmental change, it should be recognised that it has emerged from an already complex and disputed body of literature on the role of the environment in human mobility. To date, there has been little in the way of critical analysis on the potential existence of people ‘trapped’ in vulnerable locations. For example, should the category of ‘trapped’ people also include those neither explicitly recognising an environmental threat nor seeing that migration is an appropriate solution for them? Even if it does not (yet) serve to protect the rights of severely affected people, the concept of being ‘trapped’ at least highlights the non-linear relationship between migration and environmental change. In some ways, the general relationship can be thought of as mirroring the inverted ‘U’ relationship between migration and development where the axis of increasing economic development is replaced by increasing environmental damage (McLeman et al. 2015).

Rationalising seemingly irrational behaviour

Migration scholars have long recognised the cultural, social, emotional, psychological and powered factors influencing migration decision-making by individuals, households and societies (e.g. Massey et al. 1993; Lu 1999). Indeed, recent work from cognitive anthropology and social neuroscience over the way in which people make decisions in complex and uncertain environments (typical of those in which people face environmental risks) has largely rejected rational models of behaviour in favour of placing more emphasis on how the human brain actually functions (Beratan 2007). In these revised understandings, rather than viewing decision-making as a linear process involving problem definition, the delineation of alternatives and a

choice of responses, they indicate that the decision-making process involves a pathway emerging from non-conscious/preconscious and cognitive processing. In such a way, the first steps of decision-making involve an idea of a desired outcome (or avoidance of outcome) arising from the priming of past experiential learning and social discourse. Here, priming arises from a variety of sensory input, including verbal and nonverbal communication and environmental events. For example, a narrative around the benefits of migration might be primed in one area from concern over a climate threat but be ignored or contradicted in another where experiences of migration have been more negative (Schmidt-Verkerk 2012). The decision to migrate in these cases is not simply a rational summing up of benefits versus costs, but is based on previous personal and societal associations of migration and climate hazard outcomes and is subject to a number of biases.

Alternative framings of the decision-making process argue that instead of being purely rational or irrational it is of ‘in between’ nature, making use of judgments of prior knowledge and experience based on emotions, issues of trust and intuition (Zinn 2008). The use of these judgment criteria is posited to reduce the uncertainty that can arise in many decision-making situations from a lack of knowledge about a situation, a lack of time to make decisions or from the inherent complexity of conceiving how reality will play itself out. For example, in terms of migration, there remains a high level of uncertainty and non-linearity in the future employment and living environment of a would-be migrant and how the absence of a household member will affect the wellbeing of those left behind. Emotion-based judgements can be favoured in overly complex situations because of the speed at which they occur (Zinn 2008), or because they overcome the inability to analytically work out what might happen in the future (e.g. Damasio 1994).

Modelling the decision to migrate

If we put together these framings of the decision-making process, the relationship between migration and climate change is highly unlikely to be uniform across different locations, genders, cultures, experiences and environments. Rational decision models have long been applied to debates around migration and the environment to imply the relevance of classical ‘push-pull’ type theories of migration (e.g. Lee 1966) to situations of environmental stress. However, the variation in strength and direction of migration-environment relationships observed by numerous past empirical studies can be taken as evidence to support the rejection of the concept of rational decision models of such behaviour. In an effort to move beyond these classical theories of migration and towards an understanding from which each individual is afforded their own context-dependent ‘agency’, agent-based models (ABMs) have been used to a small extent to test the conditions under which large scale movements (longer distance, longer duration, larger numbers of people) are more likely to occur (Kniveton et al. 2011, 2012). However, their use represents a conflict between the ideals of social science and the accepted wisdom of the computational background of such a simulation-based approach. Finding an acceptable middle ground presents something of a challenge. So too does collecting, or gaining access to, the sort and scale of data needed to develop verified and validated simulation models.

Recently, discussions around the value and use of ‘Big Data’, such as anonymised mobile-phone data to track down population movements after disasters, have arisen (Lu et al. 2016a, 2016b). One way to effectively use the sort of spatial and social data that may be accessed from mobile phones is the development of agent-based models. As computational models that simulate the actions and interactions of autonomous agents (in this case, virtual

versions of potential migrants), agent-based models offer the greatest potential to contribute to our understanding of real-world situations when they are parameterised using data relating to real individuals. However, the breadth of data required to parameterise a model that can offer insight on a scale that is useful to policymakers, or the depth of data necessary to inform a model that can provide insight at a resolution that could be used in a humanitarian context is likely to be both costly to collect and laden with issues relating to personal privacy.

If the challenges of collecting and appropriately storing and handling data relating to the movement of people in areas affected by changes to the environment can be overcome, agent-based models may offer a means of operationalising our understanding of the complex and multifaceted nature of migration decision-making. Efforts made in this regard to date offer insight into the potential contribution that agent-based models can make to environmental migration studies in the near future (Kniveton et al. 2011, 2012; Smith 2014; Entwisle et al. 2016). Although such models should not be expected to *predict* future flows of migrants, the simulation capacity enabled by such an approach permits a rigorous scientific method to be used to undertake comparative projections of possible future scenarios and their likely (im)mobility outcomes. In such a way, scholars working this arena can aid in the development of our understanding of how migration decision-making might be manifest in the future given our understanding of the complex interactions between environment and agent that are occurring now or have occurred in the past.

Despite the promise offered by agent-based models informed by Big Data, their potential is presently limited by difficulties associated with the collection of and access to large amounts of detailed data relating to population movements. Such data will be necessary to develop well informed, and thus policy/practice-relevant, models. However, the sensitive nature of such

information and the ethical implications of its collection and use must be adequately accounted for. As such, academic progress in this regard must be paired with protection measures that do not inadvertently impose external ideals relating to mobility upon populations affected by environmental change. Before such research initiatives can realise their true potential therefore, interdisciplinary and international collaborations and agreements on the collection, management and sharing of high quality relevant data and the development of appropriate simulation structures will be necessary.

Interdisciplinary approaches to assessing the depth of environmental migration

The subject of environment and migration is characterised by a high degree of uncertainty and complexity. As a result, a wide array of methods and data have been developed to expand our understanding of the dynamics of socio-ecological systems. These techniques range from questionnaires, Q methodology, and Critical Discourse Analysis (CDA) to regressions and Bayesian network analyses. Through these different methodological approaches, additional aspects of the nexus between the environment and migration have been revealed, including issues of emergence, the role of power at multiple levels and the influence of culture, psychology and perception on migration futures.

Critical Discourse Analysis (CDA), for example, is one way to better understand the decision-making of people in a socio-psychological context. Discourses can be described as the process people engage in to reason ideas in a social space and thereby create order and meaning (Morinière and Hamza 2012). The negotiating process takes place within discourses, e.g. a

collectively space of shared reality or a ‘general domain of statements’ (Foucault 1972, 1981). Q methodology can be used to identify such discourse groups in relation to a specific subject matter.

Q methodology was originally born out of psychology (Stephenson 1935), but is now gaining ground within social science and beyond. Q is the ‘science of subjectivity’ (Stephenson 1953). The method groups people’s subjective responses in relation to a specific topic, such as climate policy and fire management, environmental migration or hurricane evacuation (e.g. Ockwell 2008; Morinière and Hamza 2012; Oakes 2014). These insights reflect the broader discourses in the study area or participant group. People’s behaviour and decision-making process are strongly influenced by current discourses and existing social norms. This is why Q and CDA shed light on social and psychological elements of (im)mobility that other research methods may not be able to capture.

A set of Q-statement cards are sorted by participants on an agree, neutral and disagree scale. There are a few important advantages with this methodology: (1) the method does not require a large sample size; there are even single participant Q-studies identifying multiple viewpoints on a discourse of a specific issue (Watts and Stenner 2012; Morinière and Hamza 2012); (2) the Q-sorting activity depends on feelings around agreement and disagreement; the risk for assumptions around what are the ‘right’ or ‘wrong’ answers are therefore lower (Watts and Stenner 2005); and (3) the Q-sorting activity is participant-led and seeks to understand the attitudes, views and subjective reality of the participant rather than ‘test’ researcher’s pre-conceived ideas.

The sorting values are entered in a software program (for example, PQ Method) to identify the discourse groups, referred to as factor groups, or subjectivity groups in Q-

terminology. The post-sorting interview around statement extremes (e.g. most agree, most disagree and neutral statements), support the understanding of each discourse group. To ensure even richer qualitative research data, the Q-sort activity can be combined with in-depth open interviews and Critical Discourse Analysis of the interview transcripts.

Inter-disciplinary methods such as Q and CDA aim to explore the complex and multifaceted depth of im(mobility) or people’s reasoning around staying and going. The methods explain the ‘unexplainable’. For example, why people decide not to evacuate, escape or move away from environmental shocks that are a direct threat to their lives. The research methods also explore how much of people’s immobility is linked to fear, emotions or feelings of doing the ‘right’ thing, e.g. taking social norms and power relation into account.

Exploring the meanings behind different perceptions of mobility

Central to the ‘new’ understandings of migration decision-making that have emerged in recent years is the role that discourse and social networks play. In terms of discourse, one can imagine a variety of socially constructed storylines around migration and the climate interacting with an individual’s past and present experience, being mediated via priming effects and heuristics to produce a preferred behavioural choice to achieve (or avoid) a particular outcome. When asked to explain a decision, an individual may then construct a logical rationale for the decision and consciously reflect on their perceived ability to achieve this behaviour.

Despite the apparent repetition by some in policy and media of an environmental determinism narrative around the subject, migration is not just dependent on environmental

factors but also on a complex interplay between multi-scale social, economic, political and demographic factors and contexts impacting livelihoods and wellbeing. As the Foresight project (Foresight 2011) posited, these drivers of migration are sensitive to the spatially and temporally differentiated impacts of global environmental change in both origin and destination locations. Less investigated, however, has been how macro, meso and micro changes (both due to global environmental change and other global transformations) in these determinants might interact with each other. Similarly, little focus has been placed on how attempts to mitigate, adapt or build resilience to the impacts of climate change may influence migration more indirectly. For example, it is not difficult to imagine that a major impact of future climate change in terms of population displacement may be the resettlement of populations from large hydropower schemes. However, it will be of paramount importance to consider who will be being resettled, by whom and for what purpose. Justifications proffered in such circumstances may include clearance of land to allow the building of climate change mitigation-related projects such as the production of biofuels, or the removal of those deemed by governments to be liable to be ‘trapped’ (unable to move) in the future. Again the ‘trapped’ narrative is increasingly taking a hold in policy circles with legitimate fears that it may be used as part of government climate change rhetoric to forcibly resettle populations (de Sherbinin et al. 2011) deemed to be at risk from future climate related hazards and appropriate the origin lands to other uses.

In contexts such as these, it is important to understand how language and power interact with one another and what the consequences may be of reducing migrating people to an anonymous moving mass, flow or stream. It is also crucial to acknowledge the dangers of shifting the responsibility of ‘how’ to adapt, build resilience or adaptive capacity to an individual

level (Bettini 2014). There are intrinsic dangers to reproducing normative language around resilience and adaptive agency, or right and wrong adaptive pathways.

Migration is not the end

As the previous discussion has shown, predictions of the exact numbers of people whose mobility pathways can be attributable to environmental change are inherently uncertain, and thus unreliable. Yet, past empirical evidence (e.g. Foresight 2011) still strongly indicates that future environmental change is likely both to reduce migration by trapping impoverished and vulnerable populations in exposed contexts, as well encourage those that can to migrate in order to build their financial, and in some cases their other, capitals.

As a corollary to the opposite impacts of environmental change that are anticipated to both increase and decrease migration, it is likely that those who are the first to migrate (the canaries down the coal mine) in response to environmental change will not be the worst off (see Cai et al. 2016 and Cattaneo and Peri 2016). It is also important to acknowledge that early- or late-arriving migrants may benefit differently from the circumstances of their arrival. On the one hand, people arriving ‘last’ might be better off due to having a strong social network in the migration destination and thus a greater chance to build up a new and better future or secure a new livelihood and housing through their social networks. However, on the other hand, people arriving first could face even more fruitful social circumstances than those arriving last as social stigmas and stereotypes around ‘new arrivals or immigrants’ are yet not in place. People in the settlement may therefore be more welcoming and supportive of new arrivals when there are fewer of them. Large urban settlements containing ‘outsiders’ such as urban slums or migrant

neighbourhoods generally face social stigmas that make it more difficult for people to achieve better housing, better jobs or better education.

Conclusion

Research efforts around emotional wellbeing, mental and psychical health, as well as a stronger psychological aspect of environmental migration, seem to these authors as a profitable endeavour to further the understanding of migration in the context of climate change. So too is a better inclusion of empirical social studies from other research areas, such as identity studies, diaspora communities and non-environmental migration studies. Interdisciplinary collaborations such as these can provide us with more complex insights that may better enable future environmental migration research to move beyond an academic pursuit of those whose migration is in some way driven by the environment towards the development of actions and initiatives that may serve to protect and benefit affected people.

Despite certain methodological advances, it is crucial that future research and policy within this arena considers the loaded nature of language and the ways in which terms such as ‘climate change’ and ‘migration’ are interpreted. Care should thus be taken not only by thinking critically about the ways these terms are used in academia, media and politics, but also in terms of what the results and consequences will be of the ways they are being used.

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1 See the Nansen Initiative’s work on moving ‘Towards a protection agenda for people displaced across borders in the context of disasters and the effects of climate change’ at www.nanseninitiative.org/ and the subsequent Platform on Disaster Displacement, a follow-up to the Nansen Initiative, at http://disasterdisplacement.org/

2 While clearly the ‘climate’ as in related to the atmosphere is a subset of the ‘[physical/natural] environment’, here we follow the Intergovernmental Panel on Climate Change in referring to the climate system as including the atmosphere, the hydrosphere, the cryosphere, the land surface and the biosphere, and so will use the terms interchangeably.

3 For example, see The Guardian, Carroll, L.O. (2017) ‘Hundreds of thousands of retired Britons in EU 'may be forced to return' www.theguardian.com/politics/2017/jan/18/retired-britons-eu-return-campaigners-pensioners-spain-healthcare and BBC, Kovacevic, T. (2017) ‘Reality Check: How many

Brits live in the rest of the EU?’ www.bbc.co.uk/news/uk-politics-eu-referendum-36046900

4 See for example BBC (2016) ‘Migrant crisis: Migration to Europe explained in seven charts’ www.bbc.co.uk/news/world-europe-34131911 and The Guardian, Mason, R. (2016) ‘Theresa May to warn UN of dangers of uncontrolled mass migration’ www.theguardian.com/world/2016/sep/19/theresa-may-to-warn-un-of-dangers-of-uncontrolled-mass-migration

5 Defense.gov News Transcript: DoD News Briefing – Secretary Rumsfeld and Gen. Myers, United States Department of Defense (defense.gov), 2002.