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Climate Adaptation, Maladaptation and (Im)mobility: Dynamics and Outcomes in Bangladesh

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Abstract

This research paper evaluates the role of human (im)mobility in climate adaptation in Bangladesh, a nation experiencing some of the worst effects of climate change. Drawing on over five years of peer-reviewed field research articles in the CliMig bibliographic database, this meta-study considers a plurality of climate-related human (im)mobilities, both forced and voluntary, occurring across a variety of ecological and geographic contexts. In the academic literature, much has been made about the context-specificity of climate change impacts on humans and the multicausal nature of climate-related (im)mobility. While this study's findings support both positions, they also highlight commonalities that cut across ecological contexts, geographic locations, (im)mobility pathways, and phases of (im)mobility. Socioeconomic factors that predate and often contribute to environmental displacement, migration, and involuntary immobility are found to remain operative throughout the (im)mobility lifecycle in the sample. Vulnerabilities are rarely resolved through (im)mobility. Indeed, because most of the (im)mobilities in the dataset are involuntary and autonomous, with climate-related displaced people receiving little or no external support, (im)mobility often becomes erosive and maladaptive.

This study's findings raise important questions relevant to the 'migration as adaptation' debate. They also highlight the pressing need for development actors, governments, funding agencies, and researchers, including those involved in Bangladesh, to become much more proactive in mainstreaming human (im)mobility into climate adaptation and disaster risk reduction (DRR) policies and strategies.

Keywords

Climate change, displacement, (im)mobilities, adaptation, Bangladesh

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Contents

List of Tables

Acronyms and Abbreviations

CBA	Community-Based Adaptation
CCA	Climate Change Adaptation
DRR	Disaster Risk Reduction
GCF	Green Climate Fund
GoB	Government of Bangladesh
ICCCAD	International Centre for Climate Change Adaptation and Development
IDMC	Internal Displacement Monitoring Centre
IDP	Internally Displaced Person(s)
IPCC	Intergovernmental Panel on Climate Change
IPCC AR6	Intergovernmental Panel on Climate Change Sixth Assessment Report
LDCs	Least Developed Countries
LLA	Locally-led Adaptation
MoDMR	Ministry of Disaster Management and Relief (Bangladesh)
MoEFCC	Ministry of Environment, Forest and Climate Change (Bangladesh)
NAP	National Adaptation Plan
NAPA	National Adaptation Programmes of Action
RMMRU	Refugee and Migratory Movements Research Unit
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

1.1Topic overview

This study focuses on human (im)mobility in the context of climate change, addressing climate-related (im)mobility dynamics and outcomes in Bangladesh.[1] Bangladesh is often described as "ground zero for climate change" (NDRC, 2018, Call et al., 2017, Paprocki, 2015). It is also regarded as a role model for integrating climate change adaptation into development policy (Khan et al., 2021b: p.1291). The research herein looks specifically at whether climate-related human mobility in Bangladesh may be considered adaptive.[2] In doing so, this paper takes up the 'migration as adaptation' debate, described in detail in the Chapter 2 Literature Review.

1.2 Study context: Climate change and (im)mobility impacts

Climate change outlook

Recent publications document a deteriorating outlook for Earth's climate and ecosystems and underscore the daunting human adaptation challenges ahead, especially for the poorest nations and communities. The IPCC's *Sixth Assessment Report* (IPCC, 2021) points to a range of plausible adverse future scenarios, all consequential for the world's most vulnerable people. The IPCC's subsequently-released *Impacts, Adaptation and Vulnerability* report warns that the rate and extent of climate change may, in some contexts, outpace and exceed the human capacity to adapt (IPCC, 2022a). Yet climate adaptation efforts, particularly climate resilience-building for poor and vulnerable communities and nations, remain underfunded and inadequate (UNEP, 2022, CIEL, 2021). The World Bank's *Groundswell Part 2* foresees up to 216 million new climate migrants by 2050. Climate-related mobility "hotspots" are likely to emerge – places that will experience significant in-migration and out-migration, potentially overwhelming already-stressed urban resettlement locations (Clement et al., 2021).

Climate change impacts and displacement in Bangladesh

Densely populated, with 165 million living in an area of 130,000 square kilometres (WorldBank, 2022), Bangladesh occupies a topography and geography naturally prone to environmental disasters. However, such events have increased in frequency and intensity due to climate change. Both sudden and slow onset disasters are common: cyclones, storm surge, sea level rise, salinization, floods, riverbank erosion, drought, and extreme heat. (Kabir and Kamruzzaman, 2022, Chowdhury et al., 2021). Due to a combination of ecological exposure and socioeconomic vulnerability, populations residing in coastal areas on the Bay of Bengal, in the country's north-western highlands, and on or near major rivers throughout Bangladesh are especially vulnerable

[1] Following Zickgraf (2021b), Boas et al. (2022b) and others, *(im)mobility* refers to the full "plurality" of human mobilities, including temporary mobility, seasonal mobility, migration, and immobility. This definition includes human mobility within and across international borders, both voluntary and forced, though this dissertation focuses solely on domestic (im)mobility.

[2] This paper follows the IPCC's definition of adaptation: "In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities" (IPCC, 2022a: p.2898).

to the adverse effects of climate change (Amjad, 2021). Bangladesh is also in a seismically-active location, with the capital city Dhaka listed as one of the 20 most earthquake-vulnerable cities in the world (WorldBank, 2013).

Human mobility in this geographical region has deep historical roots, with "[p]eople…moving through the Bangla delta for centuries" (Etzold and Mallick, 2016: p.108). While economic and geopolitical factors have been traditional drivers of migration, climate change-related impacts over the past two decades have significantly increased human mobility. The Internal Displacement Monitoring Centre reported that nearly 4.4m people in Bangladesh were displaced by environmental disasters in 2020 (IDMC, 2022). About 500,000 people per year migrate to Dhaka for climate-related reasons (Khan et al., 2021b), and countless others to major urban areas such as Chattogram and Khulna (Rahaman et al., 2018). Such influxes create stresses on urban receiving locations (Khan et al., 2021a) and lead to conditions of precarity for oft-marginalized climate migrants (Siddiqui et al., 2021). By 2050, as many as one in seven people in the country is forecast to be displaced by climate change, with up to 18 million people forced to move because of sea level rise alone (Chowdhury et al., 2021, Amjad, 2021).

However, as researchers studying climate (im)mobilities in Bangladesh and elsewhere have cautioned, the relationship between climate change impacts and human mobility is not linear (Boas et al., 2022b, Siddiqui et al., 2018), making climate-related mobility forecasting challenging. Environmental hazards may cause some people to move out of harm's way voluntarily or involuntarily while others remain *in situ* (Mallick and Schanze, 2020). Human actions and interventions – for example, the construction and maintenance of accessible, gender-friendly storm shelters and other forms of government and NGO support – can significantly influence (im)mobilities (Hadi et al., 2021, Nahin et al., 2022). Gender dynamics, cultural norms, and individual perceptions and preferences also shape (im)mobility dynamics and decisions (Furlong et al., 2022).

The highly contextual relationship between climate-related environmental impacts, human activity, and human (im)mobility is a core theme of this research paper.

1.3Research questions

This meta-study employs qualitative content analysis (QCA) methods across empirical field data from recent peer-reviewed journal articles that have been indexed in the CliMig bibliographic database and met specific selection criteria, described in Chapter 3. These field studies look at climate-related (im)mobility and adaptation across diverse eco-geographical contexts utilizing a variety of research methods. This paper explores points of divergence and convergence across the dataset, along with knowledge gaps and points of contention.

Drawing on research data on climate mobility in Bangladesh published from 2017 to early 2022, this study addresses these questions: *In what circumstances are climate-related (im)mobilities in Bangladesh genuinely adaptive? Under what conditions might human (im)mobility be maladaptive or merely short-term, non-adaptive, and unsustainable coping strategies?*

1.4 Importance of this topic

Human (im)mobility has been under-prioritized in climate adaptation policy and practice. For example, the UNFCCC's Green Climate Fund (GCF), one of the main funding mechanisms of climate adaptation for developing nations, has few (im)mobility-related projects in its existing project database (GCF, 2022). Relatedly, the National Adaptation Programme of Action (NAPA) process, launched in 2001 under UNFCCC to support LDCs in addressing the challenges of climate change, resulted in few national plans that mainstreamed climate-related (im)mobility into climate adaptation planning (Sward and Codjoe, 2012). Integrating human mobility into climate adaptation work has also been rare in community-based adaptation efforts, though it is becoming more common (Farbotko, 2020).

Koko Warner, Walter Kälin, Susan Martin, Youssef Nassef, and others have flagged the pressing need to prioritize climate-related human mobility in the current National Adaptation Plan (NAP) process.[3] They argue that mainstreaming human mobility into NAPs "provides an opportunity to ensure that migration, displacement and planned relocation are fully addressed, as both potential challenges and potential opportunities" (Warner et al., 2015: p.8, Warner et al., 2014). Unfortunately, although the National Adaptation Plan of Bangladesh (2023-2050), completed and adopted by the government of Bangladesh (GoB) in late 2022 (MoEFCC, 2022), is exemplary in its ambition, rigor, and cross-sectoral "all of society" approach to climate adaptation, it lacks the mobility focus that Warner et al. have called for.

In its current form, Bangladesh's NAP does have some potential to reduce climate-induced mobility through DRR risk reduction and the NAP's broader climate adaptation goals (e.g., through livelihood diversification and the development of climate-resilient housing, public infrastructure, and healthcare). The NAP would also address adaptation challenges in urban areas, including flood prevention and resilient WASH infrastructure. Thus, it could benefit many of the country's climate-related migrants. However, it would be a stretch to say that human mobility has been mainstreamed into the NAP. References to human mobility dynamics in adaptation planning are sparse in the 242-page NAP and mostly pertain to mobility *prevention*.[4]

The NAP includes laudable rights-affirming calls to protect and enhance the "resilience of climate migrants with a particular focus on gender and disability" (ibid.) and to provide social safety nets and other protections to those facing the adverse effects of climate change. These include protections against domestic violence, child abuse, and early childhood marriage (ibid., p.149-151), all of which can be exacerbated by climate change and climate-related mobility. However, Bangladesh's NAP arguably falls short of the comprehensive rights-based approach to addressing the needs of IDPs at all phases of the displacement cycle (pre-displacement, during displacement, and through to durable solutions) envisaged in the Guiding Principles on Internal Displacement (OHCHR, 1998) and the Sendai Framework for Disaster Risk Reduction 2015-

[3] "[E]stablished under the Cancun Adaptation Framework (CAF) to enable Parties to formulate and implement national adaptation plans (NAPs) as a means of identifying medium- and long-term adaptation needs and developing and implementing strategies and programs to address those needs" (UNFCCC, 2022b).

[4] There are, however, brief references to planned relocation of settlements at risk as "something to be considered" (ibid., p.100 and p.170). There is also a call to inventory existing and potential climate migrants, strengthen response and recovery mechanisms, and undertake "planned internal migrant management in urban areas" (ibid., p.149).

2030 (UNDRR, 2015, Yonetani, 2017). Furthermore, mobility as a potential opportunity in climate adaptation (e.g., cyclical livelihood mobility) is not systematically addressed in the NAP.

Not mainstreaming human mobility more fully in the NAP seems a missed opportunity, given the enormous challenges posed by climate change-related displacement and migration in Bangladesh. It is also puzzling, given the development in Bangladesh of a separate and impressive (albeit lower profile) framework in parallel to the NAP, the National Strategy on Internal Displacement Management (MoDMR, 2021), a rights-based strategy addressing climate-related displacement. We will look briefly at that strategy in the final chapter of this paper. Fortunately, the NAP process is an ongoing and progressive undertaking of monitoring, evaluation, and review (UNFCCC, 2022a), so there is future scope for mainstreaming climate mobility into the NAP and national policy.

1.5 Outline of chapters

This introductory chapter (Chapter 1) is followed by a literature review (Chapter 2), which surveys the academic discourses and debates on climate change risks and climate-related (im)mobility dynamics, including the role of climate (im)mobility in human adaptation to climate change. That is followed by a description of this study's research methodology (Chapter 3) and the rationale for undertaking a meta-study on Bangladesh. The subsequent chapter (Chapter 4) details this study's dataset analysis and research findings. The study's two research questions are addressed at the chapter's end. The final chapter (Chapter 5) relates the findings detailed in Chapter 4 to discourses and debates on climate-related (im)mobility and adaptation. It also considers unresolved challenges concerning climate-related (im)mobility in Bangladesh.

2. Literature review

This review of the research and policy literature looks at the oft-didactic debates on how climate change impacts individuals and communities; the interplay between human (im)mobility, climate change, and socioeconomic contexts; and the extent to which human (im)mobility may contribute to climate change adaptation.

2.1 The rise and (partial) decline of environmental determinism

The environment-migration nexus, central to the current 'migration as climate adaptation' discourse, has its roots in early migration studies. In a seminal article on the conceptualization of the natural environment in human migration studies, Etienne Piguet narrates how pioneers of migration studies positioned migration within a naturalistic framework. In the late nineteenth century, German geographer and ethnographer Friedrich Ratzel hypothesized that competition for natural resources drove migration. In the early twentieth century, the American geographer, Ellsworth Huntington, described how mass migrations of people responding to disruptive weather shifts reshaped civilizations (Piguet, 2013). However, interest in the natural environment's role in shaping migration would wane by the mid-1900s as economic and political paradigms took center stage in the migration field, with Western notions of "progress" implying "a decreasing impact of nature on human fate" (ibid., p.151).

The natural environment re-emerged in scientific discourse on migration in the 1980s and 1990s, this time through the work of environmental scientists concerned with anthropogenic climate change (ibid.). Often apocalyptic in tone, these narratives foresaw countless millions of 'climate refugees' displaced by human-induced environmental change (Bettini, 2013, Oels, 2016). In security circles, these narratives generated alarmism, such as predictions at a 2007 UN Security Council debate that climate change-induced migration would contribute to geopolitical tensions and armed conflicts (Boas, 2015). Politicians and policymakers in the Global North spun narratives of "innundat[ion] by millions of environmentally displaced peoples", often to advance anti-immigration and securitization agendas (Oliver-Smith, 2012: p.1067).

Views of climate-related migration like these have influenced humanitarian aid and development goals. Although "sedentary bias" (Bakewell, 2008: p.1342) and practices of “containment development” (Landau, 2019: p.170) have long been called out and criticized by researchers, containment and securitization impulses continue to shape the discourse on ‘climate migration’, often positioning climate-related relocation as “an adaptation failure” (Mach and Siders, 2021: p.1294). Such interests have also shaped the funding and focus of scholarly research, skewing climate migration research disproportionately toward locations in the Global South considered out-migration problem areas (Piguet et al., 2018), using "justification of avoiding harm to destination areas in order to keep climate migrants in their places of origin" (Boas et al., 2019: p.902).

Such narratives, even where well-intentioned, are problematic on multiple levels. Environmentally deterministic, they disregard social and cultural factors, including human agency, in shaping mobility and immobility dynamics. As Oliver-Smith observes, such views reflect an ontologically flawed Cartesian duality of humans as apart from nature. Climate change and its effects are not "something 'out there' but fundamentally tied to both social and ecological processes driven by human action" (2012: p.1067). Moreover, though intended to raise awareness of the effects of climate change on human populations, generally, such misguided views of climate migration dynamics haven't led to constructive policy responses or facilitated emissions reductions (Oels, 2016: p.112). Instead, they have stoked alarmist fears and helped distort migration and climate adaptation policy.

2.2 Climate-related mobility dynamics

By the late 1990s and early 2000s, anthropologists, geographers, political scientists, and other scholars involved in migration studies began to reclaim the climate migration narrative. Landmark publications from anthropologist Gaim Kibreab (1997) and geographer Richard Black (2001) "denounce[ed] the shaky empirical character and sloppy nature" of earlier work on climate-induced migration (Piguet, 2013: p.155). Black and others argued that migration, even in the context of extreme climate-induced events, is multicausal, with environmental impacts being just one set of drivers (Black, 2001, Government Office for Science, 2011). Socioeconomic, cultural, demographic, and other factors, which vary by community and within communities, also contribute significantly to mobility decisions and dynamics (Farbotko, 2020: p.3, Siddiqui et al., 2018: p.2).

Climate-induced impacts, including those contributing to migration, are sometimes seen through frameworks involving *risk*, *exposure*, *vulnerability*, and *resilience* (IPCC, 2022b).[5] The effects of climate change are generally understood to be differentially mitigated or accentuated by the degree of *exposure* of ecosystems and populations to those effects, and the relative socioeconomic, demographic, and cultural *vulnerability* and *resilience* of people and communities. As shall be discussed, migration is but one of the possible mobility-related outcomes of climate-related risk. Moreover, people migrating in the context of climate change frequently do so for multiple reasons – societal relations, political economies, and other structural and individual considerations (Weerasinghe, 2021, Etzold and Mallick, 2016), some of which pre-date or are unrelated to the adverse effects of climate change.

The Platform on Disaster Displacement states, "Compared to the impacts of the natural hazard itself, these factors [i.e., factors other than climate change] contribute as much as, and sometimes even more, to whether affected people will be able to stay or have to move" (PDD, 2020). Oliver-Smith summarizes it this way: "The problems of Andean agro-pastoralist peasant farmers or the slum dwellers of Mumbai do not start with climate change, but climate change will make their problems worse by any measure, resulting in many cases in likely displacement and migration" (2012: p.1061).

Such complexities shape both mobility decisions and the pathways through which mobilities occur. Etzold and Mallick argue, "Complex migration processes cannot be determined by nature. They are rather structured by people's perceptions of environmental, economic and political changes, by their everyday experience, their social and cultural embeddedness, and by their (in)ability to see and take on livelihood opportunities at multiple places" (2016: p.123). Contrary to the assumptions dominating the securitization discourse, climate-induced migration usually occurs within the country of origin. Those forced or compelled to move generally prefer to stay near home or lack the resources needed to migrate abroad (Ionesco et al., 2016: p.20). A dearth of international, legally-binding mechanisms supporting climate-induced cross-border migration (Human Rights Council, 2018, McAdam, 2020) no doubt also contributes to this phenomenon, though soft law, immigration law, and regional migration frameworks in some parts of the world may support cross-border environmental migration, albeit often on a limited or discretionary basis (Cantor, 2021, Weerasinghe, 2019, Wood, 2018, Ferris, 2017).

Climate-induced mobility is said to fall on a continuum, with *displacement*, which is considered involuntary, at one end of the spectrum and *migration*, which is assumed to be voluntary, at the other end (Ionesco et al., 2016: p.18, Human Rights Council, 2018: p.7). Although climate-related migration usually contains elements of both, relevant international protection frameworks, such as the Guiding Principles on Internal Displacement (OHCHR, 1998) and the Sendai Framework for Disaster Risk Reduction (UNDRR, 2015), attempt to distinguish between

[5] This paper follows the IPCC's definitions of *vulnerability* and *resilience. Vulnerability* is the "propensity or predisposition to be adversely affected…encompass[ing] a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt" (IPCC, 2022a: p.2927). *Resilience* is the "capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend or disturbance, responding or reorganising in ways that maintain their essential function, identity and structure" (IPCC, 2022a: p.2921-2).

displacement and *migration* for legal purposes, with state protection obligations mandated for those displaced or at risk of displacement but not for those considered migrants. Unsurprisingly, trying to classify complex and highly contextual mobilities in a simple binary can be problematic, "complicat[ing] the implementation of appropriate political responses" (Ionesco et al., 2016: p.18). This is particularly true in the context of slow-onset climate change events where movement is usually "not entirely voluntary or forced…with different degrees of voluntariness and constraint" (Jimenez-Damary, 2020: p.7). "[A]ffirming the forced nature of movement" in situations of gradual environmental degradation may prove contentious (Hassine, 2019: pp.14-15).

2.3 Mobility, immobility, and climate adaptation

Migration as adaptation

Notwithstanding the enduring impact of the 'securitization' and 'migration as failure' narratives, 'migration as climate adaptation' has been increasingly embraced by scholars and development actors. This approach to climate adaptation was influentially championed in the Foresight Report (Government Office for Science, 2011) and amplified in a high-profile article, "Migration as Adaptation" (Black et al., 2011). Though sounding notes of caution on the risks inherent in climate-related migration, these works positioned migration as a promising climate adaptation strategy, a premise now broadly accepted (Bose, 2015, Ionesco, 2015, Rigaud et al., 2018, Ferris, 2020).

Although climate-related mobilities are often linked to environmental degradation, the destruction of housing and infrastructure, and infectious disease outbreaks, a key focus of the 'migration as adaptation' literature is the role of livelihoods in mobility dynamics. Securing access to climate-resilient livelihoods is one of the most important strategies behind environmental migration (Government Office for Science, 2011, Etzold and Mallick, 2016). They allow "households to diversify their income and spread risk" (Ober, 2019: p.6) and "build resilience where environmental change threatens livelihoods" (Black et al., 2011: p.448). Remittances by migrants are important sources of supplemental income, sometimes used to fund investment in climate adaptation in sending communities, thereby strengthening "resilien[ce] to natural hazards, subtle environmental changes and economic turbulences" (Etzold and Mallick, 2016: p.106). Climate-related migration in such circumstances can be transformative (Sakdapolrak et al., 2016: p.85).

The 'migration as adaptation' discourse continues to evolve through the development of innovative approaches to conceptualizing and supporting climate-adaptive mobility. For example, scholars of translocality see migration as "more than a reactive coping strategy by which people are trying to reduce their vulnerability"; instead, mobility is a normal part of everyday life (Etzold and Mallick, 2016: p.108). Translocal approaches to resilience are grounded on the premise that mobility and translocal connectedness are commonplace, beneficial, and growing realities of rural and urban life (Sakdapolrak et al., 2016). Therefore, climate mobility planning can benefit from a better understanding of translocality and translocal resilience. Most intriguing, perhaps, is the proposition that existing translocal connections might

be strengthened deliberately and strategically to build resilience against climate impacts (Sakdapolrak, 2014, TransRe Project, 2018).

'Evolutionary approaches' to conceptualizing human resilience might also benefit (im)mobility research and planning (Pemberton et al., 2021). Contrasting with an engineering view of resilience, which sees affected systems returning to their original state, and the ecological view of resilience, which considers resilience as the attainment of a 'stable' new equilibrium, an evolutionary view sees "resilience as an on-going process of adaptation and re-adaptation" (Pemberton et al., 2021: p.193, Hayes et al., 2019). In a similarly spirited though less conceptual vein, the 'adaptation pathways' approach is a step-wise process that seeks to minimize risk and support flexibility in climate adaptation work, including migration and resettlement (Farbotko, 2020). This approach promotes engagement and ownership by affected communities. It can help build consensus among planners, development actors, and communities as adaptation pathways unfold, community and individual aspirations evolve, and long-term climate impacts become more apparent.

Conceptual gaps and limitations

Increasingly, researchers are taking a more critical view of the scholarship underpinning the 'migration as adaptation' narrative. Some have noted that research on migration as adaptation often perpetuates artificial binaries or perspectives that are both limited and limiting: a view of migration as one-way and permanent; undifferentiated conceptualizations of communities as 'homogeneous' and geospatially 'bounded'; and a failure to recognize the already-existing translocalities of many households and communities (Boas et al., 2019, Zickgraf, 2021a, Pemberton et al., 2021, Etzold and Mallick, 2016). Additionally, except for warnings of "trapped populations" – i.e., people and communities facing environmental adversity who lack the resources or capacity to move (Government Office for Science, 2011) – 'migration as adaptation' research frequently suffers a mobility bias. Many studies overlook complex immobility dynamics such as voluntary immobility (Farbotko and McMichael, 2019, Mallick and Schanze, 2020, Ahsan et al., 2022) or the role that circular and short-distance mobilities play in sustaining environmental non-migration (Zickgraf, 2019, Zickgraf, 2022). Another criticism is that climate mobility researchers often fail to apply a gender lens, preoccupied instead with household well-being (Zickgraf, 2021a), thereby ignoring the gendered impacts of climate change and mobility. Such effects include increased work burdens, more constraints on mobility, and exposure to climate-related risks for women (Tanyag, 2018, Eastin, 2018, CARE, 2020).

Recent articles addressing the climate-(im)mobility-gender nexus have called for a more thoughtful application of the gender lens. They suggest an approach that doesn't formulaically project fixed gender assumptions and stereotypes onto human (im)mobilities (e.g., "men as mobile and with agency", "women as immobile and deprived of agency") (Boas et al., 2022a). Instead, gender and mobility in the context of climate change are more aptly understood as a dynamic process whereby gender relations are created and re-created in real-time and therefore have the potential to change. They are not simply reproduced from the past (ibid.). In the words of Lama et al., gender is not "a variable to be measured but…a structure of social relations that organize mobility patterns and are also shaped by it" (2021: p.331).

Maladaptation

Gender-focused critiques are part of a growing body of work looking at the adverse outcomes of climate-related migration (Jacobson et al., 2018, Vinke et al., 2020, Bharadwaj, 2021). Rather than leading to a more resilient life, climate mobility may lead to new risks for migrants and IDPs, the result of what some researchers have called a "'risk exchange', … an exchange of hazards, exposures, and vulnerabilities at origin with those at destination" (Schwerdtle et al., 2021: p.1).

Many who undertake mobility as a risk reduction strategy subsequently relocate to new areas of environmental or social vulnerability, usually due to poverty and an absence of social support (Black et al., 2011, Farbotko et al., 2020). Moreover, climate migrants, particularly those who "embark on the rural-urban migration pathway with no resources, skills or social networks at their destination", may be targeted by traffickers or forced into situations of debt bondage (Bharadwaj, 2021: p.8). When remittances by migrants to sending communities fall short of expectations and needs, the well-being of the family and the community may be adversely affected (Etzold and Mallick, 2016). Such instances of maladaptation are more likely to occur when mobility is a "climate survival strategy" (Warner and Afifi, 2014: p.15) – or what Vinke refers to as an impromptu "impact response" during or after a climate event (2019: p.251) – rather than an anticipatory risk reduction measure driven by human agency.[6] Climate migration can also negatively impact receiving communities, straining social support systems, exacerbating environmental degradation, and creating societal and communal tensions (Clement et al., 2021, Aremu and Abraham, 2020).

Climate change, health, (im)mobility, and adaptation outcomes are closely intertwined and form what some scholars call "the climate change, human mobility, and health nexus" (Schwerdtle et al., 2018, Matlin et al., 2018, McMichael, 2020), a complex and dynamic interplay with important implications for development and humanitarian policy and practice. Malnutrition, heat-related illness, waterborne disease, vector and infection disease risk, and poor mental health all potentially *drive (im)mobility* – and can *result from climate (im)mobility* (McMichael, 2020, Shultz et al., 2018). Climate-related human (im)mobility might exacerbate pre-existing health conditions or lead to new health burdens. Disadvantaged rural residents displaced by environmental factors, for example, might relocate to urban slums where water, sanitation, inadequate shelter, and overcrowding create additional health risks (Rahaman et al., 2018). Likewise, "immobile populations living in sites of climate vulnerability might experience adverse health impacts as a result of changes in water and food security, climate hazards, disease ecology, and the psychosocial impacts of disrupted livelihoods" (Schwerdtle et al., 2021). Gender and other intersectional dynamics, including poverty, also greatly influence health and adaptation outcomes (Rahaman et al., 2018, Ayeb-Karlsson, 2020). Healthcare *access* is a related problem. Cost, availability of services, and residency-related restrictions create barriers to health services for many climate-related IDPs and migrants (Schwerdtle et al., 2018). Women displaced

[6] This paper follows the IPCC's definition of *maladaptation:* "[I]ncreased risk of adverse climate-related outcomes, including…increased or shifted vulnerability to climate *change*, more inequitable outcomes, or diminished welfare, now or in the future" (IPCC, 2022a: p.2915).

by climate change often lack access to adequate sexual and reproductive healthcare (Varma, 2017).

(Im)mobility outcomes are not singular events and must be evaluated over time. Environmental migrants and IDPs sometimes endure hardships in the hope of eventual improvements – if not for themselves, then at least for future generations (Vinke, 2019). Yet conditions can also deteriorate. Warner and Afifi (2014) adopt the phrase "erosive migration" to refer to mobilities that lead to greater precarity. Adger et al. observe that long-established climate migrants are more likely to experience greater insecurity than recent arrivals due to the cumulative effects of environmental shocks in migrants' new locations and the impacts of ill health, fear of eviction, and other socioeconomic stressors (2021). Ayeb-Karlsson et al. observe that previously mobile rural people, who undertook temporary 'adaptive' migration to urban areas, can become newly trapped, with deteriorating mental health simultaneously *resulting from* and *exacerbating* the inability to return to their home communities (2020).

Relating these observations to the earlier discussion of mobility drivers, the socioeconomic conditions of vulnerability that predate and contribute to environmental displacement and migration also adversely shape mobility outcomes. Etzold and Mallick note, "People's access to migration opportunities and their choice of destinations reflects existing patterns of social inequality" (2016: p.118). While insufficient education and skills among subsistence farmers and fishers can make rural livelihood diversification difficult, they also create barriers to finding employment in urban areas (Vinke, 2019). Moreover, women facing gender inequality are not only more likely to experience significant climate change impacts at home but also greater risks during displacement: increased risk of gender-based violence, including domestic violence and sexual violence; deteriorating physical, emotional, and mental health; and further erosion of financial independence (CARE, 2020: pp. 8-9, Bardosh et al., 2017, Singh et al., 2020). Children are more likely to move in response to climate-related shocks yet are especially vulnerable to the health effects of climate change and mobility (Uddin et al., 2021). Additionally, children are perhaps the most under-resourced demographic group undertaking mobility, often living in hazardous locations at "the edge of society" and excluded from services and climate adaptation efforts (UNICEF, 2021: pp.10-11).

Problematizing 'the narrative'

Indeed, the prevalence of maladaptive outcomes for those undertaking climate mobility has led many to challenge the 'migration as adaptation' narrative – particularly as it relates to people forced to undertake mobility without social or governmental support – also called "autonomous relocation" (Khan et al., 2021b: p.1291). In her forward to Vinke's book on climate migration in Bangladesh and the Marshall Islands, Helga Weisz bluntly observes: "[C]limate migration as adaptation is a euphemism that serves to justify political inaction and shifts the responsibility to adapt from the society and the polluters to the affected individuals" (Vinke, 2019: p.13). 'Migration as adaptation' advocacy is sometimes blamed for depoliticizing the causes and consequences of climate change. It obfuscates the culpability of major carbon producers and emitters (Oels, 2016: p.199, Bettini et al., 2016: p.354), thereby "shif[ing] the responsibilities to deal with climate change from the state to already overburdened and vulnerable migrants" (Sakdapolrak et al., 2016: p.90). Relatedly, the framing of 'migration as adaptation' has been

criticized for helping advance a neoliberal policy approach to a social justice issue (Felli and Castree, 2012, Bettini et al., 2016, Sakdapolrak et al., 2016). Gemenne places some of the blame for this on the research community:

> We had used environmental change to de-politicise migration and, in our quest to make research policy-relevant, we had let policies take over politics. In our attempt to stress the agency of the migrants, we had forgotten the responsibility that we had towards them (2015: p.71).

2.4 Vulnerability, resilience-building, and self-determination

> Of all the specific liberties which may come into our minds when we hear the word "freedom," freedom of movement is historically the oldest and also the most elementary. Being able to depart for where we will is the prototypal gesture of being free (Arendt, 1955: p.12).

This passage from Hannah Arendt, oft-quoted in the refugee protection literature (see Landau, 2019: p.181, de Genova and Puetz, 2010: p.33), highlights one of the fundamental rights gaps in the lives of refugees and displaced persons – freedom of mobility. In light of the complexity and contextuality of climate-related mobility and immobility, however, surely any normative framework supporting mobility-related self-determination must also include the 'freedom to stay'.

Farbotko (2018, 2022) observes that many households and communities choose not to move out of climate change-affected areas, even when 'experts' deem that *in situ* adaptation is no longer viable. Citing "cultural, historical, and spiritual attachments to place, and political considerations such as self-determination", she states that "[n]ational governments and humanitarian organizations concerned with climate migration arguably have an obligation to support the decisions made by individual communities to retreat or remain" (ibid.). Zickgraf, noting that mobility and immobility should not be seen as distinct or separate from one another, cautions that researchers and policymakers should "privilege neither immobility nor mobility" in how they approach climate-related (im)mobility dynamics (Zickgraf, 2019). Long offers a slightly different take on what 'neither privileging mobility or immobility' means for IDPs: "What needs to occur to 'solve' a protracted displacement is not necessarily an end to movement, but rather an end to *forced* movements that offer only partial or inadequate protections" [emphasis added] (Long, 2011: p.15). While Arendt, Farbotko, Zickgraf, and Long articulate different perspectives on mobility, their words reflect a common conviction – the right to self-determination.

The aspiration-capabilities framework

The "aspirations-capabilities framework" may help conceptualize the dynamic relationship between (im)mobility and self-determination. Created by Carling as a tool for understanding involuntary immobility, the framework positions the *aspiration* and *ability* to migrate as distinct variables (Carling, 2002: p.334, Schewel, 2019). Originally known as the "aspiration-ability model", its current iteration, the "aspirations-capabilities framework", has found its way into

environmental (im)mobility scholarship as a framework for unpacking the complexities of immobility (Mallick and Schanze, 2020, Zickgraf, 2021b).

A significant strength of the framework is the conceptualization of mobility and immobility as "complementary manifestations of the same migratory agency" (Zickgraf, 2021b: p.126). The framework also foregrounds the role of structural dynamics (social, cultural, behavioural) in shaping mobility dynamics (de Haas, 2014). de Haas further improved the framework, swapping the original category "ability" for the conceptually richer "capability", drawing upon Sen's notion of capability building as the goal of development, thereby "more explicitly connecting (im)mobility outcomes to development processes " (Schewel, 2019: p.334).

Schewel further refined the framework by adding a new category of (im)mobility dynamics – "acquiescent immobility" – to address Carling's and de Haas's "relative neglect of the category and determinants of voluntary immobility" (p.335). It refers to people lacking the capabilities to move but who would not aspire to move if they did.

Schewel visually represents the framework as a dual-axis graph depicting four quadrants of (im)mobility: *voluntary immobility*, *mobility*, *involuntary immobility*, and *acquiescent immobility*.

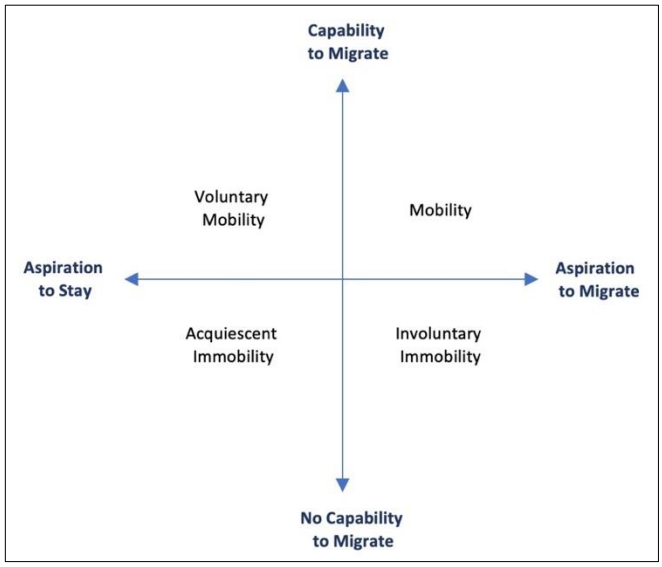

Figure 1: (Im)mobility categories suggested by the aspiration-capability framework. (Schewel, 2019, p.335, redrawn for this paper.)

Interestingly, the framework's limitations become more apparent when represented as four quadrants formed by the *Aspirations* and *Capabilities* axes. There is no *Involuntary Mobility* category; *mobility* is only present as *voluntary*. Moreover, distress migration situations are described problematically in terms of 'aspirations'. Anticipating such criticisms, Schewel and Carling argue that "there is no clear theoretical distinction between 'forced' and 'voluntary' migration, as almost all forms of migration entail choices and constraints" (ibid., p.336; Carling,

2002). They also explain that "a migration 'aspiration' is defined simply as a conviction that migration is preferable to non-migration…vary[ing] in degree and in the balance between choice and coercion" (Schewel, 2019: p.336, Carling and Schewel, 2018).

However, considering the existential threats to communities and cultures posed by climate change and the related climate-justice considerations, the label 'aspiration' is arguably not sufficiently nuanced for describing the (im)mobility-related predicaments of people under duress. Indeed, the term could be seen as decontextualizing injustice and trivializing suffering. Given the generally weak international protections available to IDPs, partly due to reliance on simplistic binary distinctions between forced versus voluntary mobility in international law, surely there's a need for a richer conceptual vocabulary for migration under duress. Long makes this point rhetorically. "In states where few citizens can seriously claim to have adequate access to a full complement of socioeconomic rights, where does displacement end and migration begin?" (Long, 2011: p.16).

Notwithstanding these criticisms, one can see how the aspiration-capabilities lens might benefit a rights-based approach to climate adaptation and (im)mobility – for example, by informing community-led (im)mobility planning, providing benchmarks for evaluating disaster risk reduction (DRR) effectiveness, and shaping policy frameworks in support of self-determination.

Vulnerability and resilience

Earlier, it was noted that the risks imposed by climate change are often considered a function of the relative exposure of ecosystems and populations to potential hazards, exacerbated by the relative vulnerabilities of those populations and mitigated by their relative resilience. Written as a simple equation, $Risk = E*V/R$ where E = Exposure, V=Vulnerability, and R=Resilience. If, as the IPCC warns, humanity is at risk of entering an era where the pace and extent of climate change would likely exceed the human ability to adapt and limit its exposure (IPCC, 2022b), then addressing the socioeconomic drivers of vulnerability and resilience, the V and R components of the equation, will become even more critical to managing risk. The extent to which (im)mobility in the context of climate change will be voluntary or involuntary – and whether (im)mobilities are adaptive, maladaptive, or merely short-term coping strategies – will be shaped by how effectively vulnerability and resilience are addressed in adaptation policy and practice.

Climate adaptation actors must adopt a broad view of vulnerability and resilience to be effective. Kelman et al. observe:

> Vulnerability and resilience are often presented as being the current state, whereas examining a long-term process with a past and future is needed. Vulnerability and resilience are not only about the present state, but are also about what society has done to itself (and especially what some sectors have done to other sectors) over the long-term; why and how society has taken that set of actions in order to reach the present state; and how society might change the present state to improve in the future (2015: p.23).

Without embracing such a broad perspective, climate adaptation efforts risk ignoring – and exacerbating – some of the very conditions that drive risk. If the primary goal of resilience is merely the restoration of pre-impact states of being – what Pemberton referred to as the "engineering approach to resilience" (2021: p.193) – then any benefits from climate adaptation, regardless of the (im)mobility strategy, might prove short-lived.

Community-led adaptation

Practitioners and researchers have observed that adaptation policy must be responsive to individual and community aspirations, strategies, and visions for the future and should not be a top-down process (Mach and Siders, 2021: p.1299, Government Office for Science, 2011, Farbotko, 2020: p.2). Adaptation outcomes are much more likely to succeed when affected communities actively engage in a process that supports self-determination (Farbotko et al., 2020: p.703) through an approach based upon "consultative, inclusive, place-, and culture-specific processes that provide resources to support migrants' mobility decisions" (Gonzalez, 2020: p.129, Ransan-Cooper et al., 2015). Notably, the community-based climate adaptation (CBA) *Principles for Locally-Led Adaptation* (LLA), embraced by over 70 governments, international institutions, and international and local NGOs, calls for: "Developing decision making at the lowest level appropriate level" (Principle 1); "Providing patient and predictable funding that can be accessed [at the local level] more easily" (Principle 3); and "Investing in local capabilities to leave an institutional legacy" (Principle 4) (IIED, 2021a, IIED, 2021b).

Yet, climate adaptation work is often deficient in these areas. In addition to being woefully underfunded (UNEP, 2022), climate adaptation often "lack[s] a Human Rights-based Approach" and "fail[s] to adequately consider the poorest in society", in particular, in infrastructure and market-based projects (CARE, 2021: p.31). Historically, a major contributing factor is that climate adaptation finance has been largely inaccessible at the local level, with less than ten percent of total adaptation funding earmarked for locally-focused projects between 2003 and 2016 (CIEL, 2021, Soanes et al., 2017). Moreover, few development funding mechanisms address climate displacement or, more broadly, the needs of IDPs, climate-related or otherwise, seeking durable solutions (Heggennes and Bilak, 2021).

CBA, too, would benefit from a greater focus on (im)mobility. "Community-based adaptation to climate change that takes human mobility into account is rare, though it is beginning to be identified as a policy priority" (Farbotko, 2020: p.13). Still, climate adaptation should not be dictated by the *a priori* preferences of governments or development actors for mobility or immobility. "A comprehensive understanding of how environmental vulnerabilities compound preexisting vulnerabilities is essential to the formulation of useful [mobility-related] responses…Policy must be adapted and implemented according to particular populations and needs" (Zickgraf et al., 2016: p.18).

In other words, climate adaptation policy should promote self-determination by helping communities develop capabilities that support their (im)mobility aspirations.

3. Research Methodology

3.1 Why a meta-study on Bangladesh?

The introduction to this paper mentioned the extant and acute climate change and climate (im)mobility challenges faced by Bangladesh. The country is seen as "offering early warning signs of impacts that may soon affect other regions" (Adams and Kay, 2019: p.131). It is also seen as in the vanguard of mainstreaming climate adaptation and disaster risk reduction into development policy (Khan et al., 2021b, Haque et al., 2019a, UNDRR, 2019, WorldBank, 2016). As such, Bangladesh can serve as a role model for other nations, particularly LDCs, grappling with the adverse effects of climate change.

As part of an "all of society" approach to building climate resiliency, Bangladesh has encouraged extensive research on climate change and climate adaptation efforts – from both Bangladeshi and international researchers. As a result, climate change adaptation and climate-related (im)mobility have been extensively researched in the country, providing rich data for a meta-study. But this begs the question: Do we need a meta-study on Bangladesh?

This author knows of no meta-studies of climate-related (im)mobility field research in Bangladesh.[7] However, multiple meta-studies have been published outside of Bangladesh in recent years, and these have helped identify critical research, knowledge, and methodological gaps in the field. Some of these meta-studies were referenced in the literature review. Piguet et al.'s observation that a Northern "securitization" agenda has shaped research funding and priorities was derived from their systematic review of the environmental migration research landscape (2018). Zickgraf's description of a general "mobility bias" (i.e., the ignoring of *immobility*) in 'climate migration' research was supported by her rapid literature review of articles addressing human mobility in the context of slow-onset climate events (2021a). She also identified a need for longitudinal climate-related (im)mobility studies in that review.

Other noteworthy meta-studies include Borderon et al.'s review of African research data. They observed that methodological differences across studies, combined with the context-specificity of climate change impacts in the region, have made it challenging to identify cross-context "regularities in the environmental change and migration nexus" (2019: p.523). Chumky et al., in their systematic review, lament the relative paucity of articles from around the world that address long-term environmental migration (2022). They also found that, while ecological and economic drivers of disaster migration were well-studied, more research is needed on social and political factors affecting disaster migration.

This meta-study is designed to address the limitations associated with single, small-sample field research undertakings. It is also intended to shed light on some of the gaps described in the above-referenced meta-studies. This study's dataset, as we shall see, covers a plurality of

[7] There is a literature review addressing climate adaptation in Bangladesh (Chowdhury et al., 2022). While primarily focused on adaptation challenges and barriers, the article briefly references displacement when adaptation is lacking. The article, itself indexed in CliMig, includes only three CliMig-indexed articles in its extensive list of references, two of which met this study's criteria and were included in the dataset (Chowdhury et al., 2020, Islam, 2018).

(im)mobilities and mobility pathways. It includes data on and insights into diverse environmental contexts in both migrant sending (place of origin) and receiving (destination) locations. Moreover, it includes articles addressing the climate change-(im)mobility nexus from a diverse range of economic, social, political, health, and gender perspectives. When aggregated, field research data from Bangladesh becomes context-rich, thus aiding the identification of patterns and commonalities across contexts.

Finally, to paraphrase Schwerdlte et al., human mobility is a journey without beginning or end (Schwerdtle et al., 2021). Longitudinal studies are needed to help us better understand how climate-related (im)mobilities take shape, evolve, and play out. Although the research dataset does not include any individual longitudinal studies, the studies collectively address different phases or stages of mobility and (im)mobility. Considering these stages together helps create a composite view – of (im)mobility dynamics and adaptation outcomes spanning space, time, and other contexts.

3.2 Research methods

The research for this dissertation was entirely desk-based. The study's dataset is comprised of thirty-six academic journal articles indexed in the CliMig bibliographic database, with pub dates ranging from January 2017 to January 2022. The study employed qualitative content analysis (QCA) to identify thematic points of convergence and divergence across the sample.

CliMig Bibliographic Database

CliMig is "the first comprehensive collection of resources specifically concentrating on *migration, the environment* and *climate change"* (CliMig, 2023). It is a database of academic literature curated at the Institute of Geography, University of Neuchâtel. Currently, CliMig includes over 1500 peer-reviewed scientific publications on climate migration. Several noteworthy research projects have utilized CliMig, including the rapid review studies by Borderon and Zickgraf and the systematic review by Piguet et al. mentioned above.

The appendix in Piguet et al. describes the database and its curation policies and guidelines (Piguet et al., 2018: pp.375-377). To summarize:

> The CliMig team monitors a broad array of academic literature from peer-reviewed journals, books, scientific reports, peer-reviewed working papers, and grey literature meeting IPCC guidelines. Only articles on the following climate-related mobility topics are included in the CliMig database:
>
> - Population displacement potentially caused by environmental change
> - Displacement as a coping strategy due to environmental change
> - Perception/representation of the migration/environment nexus
> - Policies and legal issues related to migration and environmental change *Article Selection*

The CliMig team provided this author with a copy of the CliMig database in EndNote format in January 2022. At that time, there were approximately 200 articles on Bangladesh in CliMig. The criteria used to select articles for this paper were:

- Publications in peer-reviewed journals.
- Articles involving field-based empirical studies in Bangladesh.
- Comparative studies involving research participants outside of Bangladesh were excluded.
- Articles that didn't explicitly include field research data on (im)mobility were excluded.

The thirty-six articles comprising this study's dataset, published between January 2017 and January 2022, are found in the *Primary Data* section of the bibliography (p.50). A breakdown of titles by publication year, authorship, and research methodologies is found in Table 1 (p.22).

Data management and coding framework

This study employed qualitative data analysis (QCA) methods to the database. The software package NVIVO, Release 1.6.2 for Mac, was used to store, code, manage and analyse the data. Coding and content analysis were performed manually.

The QCA coding frame was developed using guidelines by Margrit Schreier (2012, 2014). The coding frame was concept-driven for the main categories and data-driven for subcategories, with subcategories developed via subsumption.

The result of an iterative process, the final coding frame was structured around *geographic and ecological contexts*; *(im)mobility types* (e.g., voluntary (im)mobility, involuntary mobility, circular/temporary, etc.); *mobility pathways* (e.g., urban-to-rural, rural-to-rural); and *factors contributing to (im)mobility dynamics and outcomes* (e.g., socioeconomic factors, gender dynamics, environmental exposure, health, etc.). Additionally, data were categorized according to whether they were sourced from studies of *sending locations*, *receiving locations*, or *both sending and receiving locations*. This helped enable a view of the entire (im)mobility cycle, including pre-(im)mobility and post-(im)mobility contexts and dynamics. Once common patterns across sending and receiving locations began to emerge in the analysis phase of the study, sending and receiving location subcategories were standardized to support a consistent view of different stages of the (im)mobility lifecycle.

3.3 Limitations

QCA is a descriptive approach to content. One weakness is that content to be analysed is taken as factually accurate or 'given'. It is possible that researcher bias by the original study authors has impacted the content in this study's database.

Few studies in our sample mentioned government or NGO interventions, and even fewer mentioned successful interventions. This may reflect researcher bias – for example, a deliberate ignoring of interventions during data gathering or selecting study locations where government and NGO interventions are rare. Lack of knowledge of government and NGO activities in the

field shouldn't be an issue, especially given the high proportion of Bangladeshi authors in this study's article dataset.

4. Climate-related (im)mobilities in Bangladesh: Data and findings

4.1 Introduction

This chapter takes a deeper look at climate-related mobility dynamics in Bangladesh. It probes the dataset's plurality of (im)mobilities and the socioeconomic factors that shape mobility pathways and outcomes. It then analyses the data across sending and receiving locations, highlighting emergent patterns and themes. At the chapter's end, we return to the research questions: *In what circumstances are climate-related (im)mobilities in Bangladesh genuinely adaptive? Under what conditions might human (im)mobility be maladaptive or merely short-term, non-adaptive, and unsustainable coping strategies?*

4.2 Dataset and research contexts

Thirty-six studies in the CliMig database published between January 1, 2017, and January 22, 2022, met this dissertation's selection criteria, summarized in *Chapter 3: Research Methodology*. The bibliographic data for these may be found in the *Primary Data* section of the *Bibliography*

Primary Data: Overview of Articles in Dataset

Articles by Publication Year	2017	6
	2018	6
	2019	8
	2020	10
	2021	5
	2022	1
	TOTAL	36
Methodology	Quantitative	15
	Qualitative	5
	Mixed Methods	16
Location of Study Population	Rural	24
	Urban	10
	Both Rural and Urban	2
Location of Authors (based on institutional affiliation)	Bangladesh-based	19
	Based outside of Bangladesh	9
	Mixed locations	8

Table 1

(p.50). Information on publications by year, methodologies employed, field research locations, and location of authors' research institutes may be found in Table 1.

Nearly all studies in the dataset described specific climate change-related environmental impacts affecting human (im)mobility, with the majority identifying more than one environmental factor. Riverbank erosion (17), cyclones (15), and flooding (13) were the most frequently mentioned environmental impacts. Sea level rise, storm surge, extreme heat, salinization, drought, flooding, coastal erosion, waterlogging, and dense fog were also mentioned. Three studies described the environmental impacts as "slow onset"; three described them as "rapid-onset"; seven described a combination of slow and rapid-onset events. Most studies explicitly or tacitly acknowledged that (im)mobilities were often multicausal and not solely linked to environmental variability.

4.3 A Plurality of (im)mobilities

The design of this meta-study was intended to facilitate an appreciation of what Boas et al. refer to as a "plurality of mobilities" (2022: p.336). (Im)mobilities in the dataset stretch beyond the general meaning of the word *migration*, "which in discourses of climate change tends to be interpreted as representing one-off, long-distance and cross-border movements of large groups of people" (ibid.). Collectively, the thirty-six field studies reveal a broad array of climate-related (im)mobility pathways and drivers across and within communities in Bangladesh.

Types of (im)mobility

Twenty studies addressed *rural-to-urban* migration; sixteen addressed *rural-to-rural* migration; one discussed *urban-to-urban* migration. Four studies identified people and groups *displaced multiple times* over their lifetimes. Two studies addressing rural-to-urban mobility found that some urban migrants and IDPs had previously undertaken rural-to-rural mobilities.

One-third (12) of the articles referenced temporary mobilities – either short-term involuntary environmental displacements or deliberate coping relocations during and after environmental events. Circular and seasonal mobilities were also commonplace, mentioned in eight studies. Working-age adult men undertook most of the seasonal/circular mobilities described in the dataset, usually pursuing alternative livelihoods when traditional livelihoods were strained. Overwhelmingly, studies reported a general desire among populations "to stay" *in situ* despite the onset of adverse climate impacts. Those affected strongly preferred temporary mobility over permanent relocation when climate-related mobility occurred.

Voluntary vs. involuntary (im)mobility

Climate-related (im)mobilities, as discussed in the literature review, are generally seen as falling on a continuum between voluntary at one end of the spectrum and forced/involuntary at the other. While seasonal mobilities were usually of a voluntary nature, most of the other (im)mobilities in the dataset were more involuntary in nature. Table 2 shows how mobilities described in the sample fall on the "voluntary-involuntary" continuum.

Coercion vs. Choice	(Im)mobility Reason	Definition	# of studies referencing
Forced	*Impact Response*[8]	(Im)mobility undertaken in reaction to recent or ongoing adverse environmental events. Generally, when (im)mobility constituted an "impact response, " no acceptable alternative pathways were available.	18
	Planned/Survival	(Im)mobility undertaken in reaction to or in anticipation of adverse environmental events. Prior to the (im)mobility, there was time for planning and consideration of possible alternative pathways. This category included temporary and unanticipated livelihood mobilities after disasters.	13
	Strategic/Preventative	(Im)mobility undertaken before adverse environmental impacts became detrimental. (Im)mobility was deliberate and strategic, with ample time, capabilities, and resources to facilitate (im)mobility. This category included most circular/seasonal livelihood mobilities.	7
Voluntary	*Aspirational*	(Im)mobility undertaken was consistent with the wishes of individuals. There was adequate planning time and ample capabilities and resources. There was a high likelihood of positive outcomes aligned with aspirations.	2

Table 2: (Im)mobility 'Voluntariness' Spectrum

Eight studies referenced immobility. Two of these focused on voluntary immobility, describing climate adaptation strategies that enabled voluntary non-migration (Biswas and Mallick, 2020,

[8] The term "Impact response" was adapted from Vinke's *Unsettled Settlements* (2019).

Paul et al., 2020). Six addressed involuntary immobility. Notably, three referenced populations trapped at destination – previously mobile individuals or groups that had become involuntarily immobile after resettlement (Schwerdtle et al., 2021, Adger et al., 2021, Ayeb-Karlsson et al., 2020). Interestingly, another study described instances of environmental change leading to the disruption of existing and well-established livelihood mobilities central to the translocal lives of people in rural communities (Call et al., 2017). Although the authors of that study did not describe these disruptions as "involuntary immobilities", environmental factors effectively rendered migrants involuntarily immobile.

Notably, all of the (im)mobilities discussed in the thirty-six articles may be described as *autonomous (im)mobility* involving little or no government or NGO planning or support before, during, or after the (im)mobility. The apparent absence or near-absence of GoB support of climate-related IDPs and migrants in the dataset is surprising, given Bangladesh's reputation as a leader in integrating DRR and climate adaptation into development and its commitments under various international frameworks.[9]

4.4 Plural but not equal

This study's dataset captures a broad diversity of climate-related human (im)mobilities across communities in Bangladesh: mobility and immobility; circular, temporary, and permanent mobility; voluntary and involuntary (im)mobility; and spatially and geographically distinct mobility pathways (rural-to-rural, rural-to-urban, and urban-to-urban). Certain studies also point to a plurality of mobilities *within* communities. These studies reveal contrasting (im)mobility dynamics among individuals and groups, primarily driven by socioeconomic factors, including gender dynamics.

In one study, relatively affluent individuals and families were more likely to undertake voluntary, strategic relocations than poorer community members – either responding to or anticipating environmental degradation (Islam and Shamsuddoha, 2017). Poorer people, lacking the capabilities to undertake anticipatory relocation, ran a much higher risk of being 'trapped' *in situ* or forced into unplanned survival-related displacement when severe climate variabilities occurred.

Intersectionality exacerbated this. According to several studies, gendered normative expectations led more women to stay behind to manage the household, family, and local livelihoods while men undertook labor migration. Poorer women, therefore, often experienced even greater exposure to environmental hazards in their places of origin, increasing their likelihood of *in-situ* entrapment and personal tragedy (Call et al., 2017, Islam and Shamsuddoha, 2017, Ayeb-Karlsson, 2020, Chowdhury and Masud, 2020, Evertsen and van der Geest, 2020).

According to one study, women's mobilities were curtailed when men extended their time away from home, decreasing aspirational migration for education or marriage (Call et al., 2017). Moreover, due to security, privacy, health, and sanitation concerns, unaccompanied rural women

[9] The Guiding Principles on Internal Displacement, The Sendai Framework for Disaster Risk Reduction 2015 – 2030, and the various human rights treaties ratified by Bangladesh that are relevant to climate displacement (see Khan and Scott, 2020: p.5 for a list of treaties).

were often reluctant to undertake protective micro-mobilities during peak hazard periods, such as relocation to storm shelters. This increased risk of personal tragedy, including death (Ayeb-Karlsson, 2020).

Zickgraf has observed that mobility and (im)mobility are not binary but rather "relational" (2022). In the above discussion of gendered (im)mobility, we can see how particular environmental (im)mobility pathways – those of men and women within a family unit – don't exist in isolation. One form of mobility (men's seasonal mobility) is dependent upon another (women's immobility) and, sometimes, vice versa. Relational mobilities co-shape and are co-dependent. They mutually enable. And they are relational in another critical respect. Gendered (im)mobilities have gendered impacts – on the (im)mobility choices, pathways, and outcomes of those involved.

4.5 Socioeconomic factors affecting (im)mobility and adaptation outcomes

Having had a chance to consider the broad array of climate-related mobilities across and within communities and locations in Bangladesh, we now take a closer look at the socioeconomic factors that shaped climate-related (im)mobility dynamics and adaptation. First, we will look at socioeconomic data from studies referencing (im)mobility dynamics and outcomes in *sending locations* – areas, often places of origin, from which climate-related (im)mobility emanated. We will then look at socioeconomic data from studies of *receiving locations* – destinations where climate IDPs and migrants resettled, either temporarily or long-term. Finally, we will consider emergent patterns and themes within and across sending and receiving locations that may help answer this study's research questions.

4.5.1 Data from sending locations

(Im)mobilities

Twenty-one of the twenty-seven sending-location studies described or provided data on whether (im)mobilities were voluntary, involuntary, or on the spectrum between the two points. Fourteen of those studies described mobilities that met the definition of *impact response*; eleven described (im)mobilities that fit the category of *planned/survival* (im)mobility; five fit the category of *strategic/preventative* (im)mobility; two met the criteria for *aspirational* (im)mobility. (See Table 3)

Degree of 'Voluntariness'	**Impact Response** *(coerced)*		**Planned/Survival**		**Strategic/ Preventative**		**Aspirational** *(chosen)*	
Studies Referencing (21 in total)	14	67%	11	52%	5	24%	2	9%

Table 3: (Im)mobility 'Voluntariness' – Sending Locations (NB: Some studies describe multiple instances of (im)mobility.)

In line with the parameters proposed earlier for distinguishing "Forced" and "Voluntary" (im)mobility, Table 4 aggregates the data in Table 3 into *Forced (Im)mobility* and *Voluntary (Im)mobility*. The aggregation method adjusts for multiple instances of (im)mobility in some studies.

Forced vs. Voluntary	**Forced (Im)mobility:** *Impact Response or Planned/Survival (Im)mobility*		**Voluntary (Im)mobility:** *Strategic/Preventative or Aspirational (Im)mobility*	
Studies Referencing (21 in total)	19	90%	6	29%

Table 4: Forced vs. Voluntary (Im)mobility – Sending Locations (NB: Some studies describe multiple (im)mobility undertakings.)

Ninety percent of the sending location studies described forced (im)mobility. Twenty-nine percent of the studies described voluntary (im)mobility. However, such references to voluntary (im)mobility often occurred alongside descriptions of forced (im)mobility within the same community – for example, in studies contrasting (im)mobilities of different community groups.

We will now look at factors identified in sending-location studies that affected (im)mobility dynamics, including pathways and outcomes. For this discussion and the remainder of this chapter, Table 5 will be referenced. Table 5 summarizes socioeconomic factors that, combined with environmental stressors, contributed to (im)mobilities, including outcomes. This data has been split out by sending and receiving locations. Gender dynamics, referenced in the dataset in relation to many of these factors, will be discussed at the end of this section.

Supportive/enabling factors in studies of sending locations

As shown in Table 5, twenty-six percent of the studies in this sample mentioned conditions supportive of study participants' (im)mobility aspirations. Most of these were economic factors that supported voluntary non-migration: sufficiently diversified livelihoods less vulnerable to climate variability, natural resources, land availability, and reliable roads and other public infrastructure. Additionally, the positive impacts of remittances from seasonal migration were also observed. These supported home water and sanitation investments and better healthcare-seeking behavior (Chowdhury et al., 2020). Positive social capital – assistance from family, neighbors, and community-based organizations – and reconstruction assistance from government organizations were seen as supporting voluntary non-migration. Positive factors were mentioned in only one case involving voluntary mobility – the role of relative wealth and education in enabling people to undertake strategic migration out of rural slow-onset disaster areas (Islam and Shamsuddoha, 2017).

Burdensome/Inhibiting factors in studies of sending locations

Nearly all of the sending-location studies (93%) addressed factors that burdened or inhibited (im)mobility aspirations and negatively affected (im)mobility outcomes. Seventy percent of the studies cited the adverse effects of climate change on family income. Environmental damage to land and the destruction of livelihoods (e.g., farming and shrimp cultivation) were commonly

Table 5: Factors impacting (Im)mobility Dynamics and Outcomes

	Sending Locations		Receiving Locations	
	Number	*Percentage*	*Number*	*Percentage*
Number of Studies	**27**		**21**	
Supportive/Enabling (1)	**7**	**26%**	**10**	**48%**
Economic	6	22%	3	14%
Livelihoods (adequate, diversified, etc.)	3		1	
Job availablity			2	
Livelihood-related Infrastructure (e.g., roads)	1			
Land - available and affordable				
Natural Resources	1			
Wealth (relative), eduction/skills	1		2	
Social Capital (Family/neighbors/CBOs)	2	7%	5	24%
NGO or Government Interventions	2	7%	1	5%
Burdensome/Inhibiting	**25**	**93%**	**20**	**95%**
Economic - Livelihood	19	70%	14	67%
Inadequate income, jobs	15		13	
Loss of or damage to land and livelihoods	11		2	
Skills, education	4		1	
Working Conditions (hazardous, burdensome)	1		4	
Disruption to seasonal/temporary mobility	1			
Access to credit/microfinance			1	
Economic - Other	13	48%	12	57%
Poverty	7		6	
Debt	5		5	
Lack of social safety net			2	
Socioeconomic Discrimination/ Exclusion (non-gendered)	4	15%	8	38%
Shelter and Community Infrastructure	8	30%	15	71%
Housing - Lost, Damaged (or indadquate)	5		6	
WASH	3		10	
Food Security and Nutrition	6	22%	5	24%
Health	7	26%	11	52%
WASH Related	3		6	
Other Physical	4		4	
Mental	2		3	
Healthcare Access	3	11%	9	43%
Access to Other Services	4	15%	5	24%
Other Loss-and-Damage	7	26%	2	10%

Notes:
(1) Contributing to beneficial mobility dynaimcs and outcomes, in line with (im)mobility aspirations.
(2) Burdens mobility dynaimcs and outcomes; inhibits (im)mobility aspirations.

reported. Inadequate skills and education were described in four studies as inhibiting livelihood diversification (15%).

Forty-eight percent of the studies mentioned other burdensome socioeconomic factors. Poverty and debt, traditionally endemic but further exacerbated by climate change, were the most frequently described non-livelihood economic burdens (26% and 19%, respectively). Socioeconomic discrimination and exclusion – fear of eviction, exploitative labour practices, and

lack of legal recourse – also contributed to precarity (15%). Poor shelter and infrastructure, including WASH, housing, and evacuation shelters, were observed as detrimentally impacting (im)mobility dynamics and outcomes (30%). Food security and nutritional intake had deteriorated in twenty-two percent of the studies due to crop damage, degradation of agricultural land, and inability to pay for food.

Twenty-six percent of the studies listed climate change-related health burdens, with health problems frequently more severe for women, children, the elderly, and people with disabilities. Water salinity exposure, vector-borne and water-borne diseases, and intense sun and heat-related illnesses were common. Mental health burdens were reported, with trauma, depression, and anxiety disorders prevalent (Islam and Shamsuddoha, 2017, Rahaman et al., 2018, Sams, 2019, Chowdhury et al., 2020, Rahman and Gain, 2020, Schwerdtle et al., 2021).

Relatedly, accessing quality healthcare, a challenge even without the impacts of climate change, was further compromised by climate events – due to cost, inadequate community disaster preparedness, and damaged facilities (Islam, 2018, Kamal and Abedin, 2019, Sams, 2019). Diminished health could negatively impact the family economy. One study reported a significant loss of income-generating workdays due to illness and burdensome increases in family healthcare expenditures (Sultana et al., 2019).

Other factors impacting (im)mobility dynamics and outcomes included reduced access to public services (15%) and various forms of loss-and-damage not otherwise captured in the other socioeconomic categories (26%), including the death of family members and loss of cultural institutions.

Gender dynamics cut across several categories. Due to gender-differentiated (im)mobilities, women, being more likely to remain *in situ* than men, bore the brunt of adverse climate-related impacts in sending locations. Some of the gendered effects described in the database include: the impact on female health of water salinity; damaged or inadequate WASH infrastructure; growing water and food insecurity; and inadequate, unsafe, and unsanitary storm shelters (Islam, 2018, Chowdhury et al., 2020, Ayeb-Karlsson, 2020). One study addressing gender imbalances observed that when disaster struck, women were less able to move than men (ibid). Another study noted that when women did move, they often did so only after the onset of severe environmental conditions, with adverse outcomes (Evertsen and van der Geest, 2020).

4.5.2 Data from receiving locations

(Im)mobilities

Twenty-one studies in the dataset discussed mobility dynamics and outcomes in receiving locations. Seventeen of those addressed the level of 'voluntariness' of the (im)mobilities: thirteen described mobilities that met the definition of *impact response*; six described (im)mobilities that met the criteria for *planned/survival* (im)mobility; four aligned with the definition of *strategic/preventative* (im)mobility*;* none met the criteria for *aspirational* (im)mobility. (See Table 6)

Degree of 'Voluntariness'	**Impact Response** *(coerced)*		**Planned/Survival**		**Strategic/ Preventative**		**Aspirational** *(chosen)*	
Studies Referencing (17 in total)	13	76%	6	35%	4	24%	0	0%

Table 6: (Im)mobility 'Voluntariness' – Receiving Locations (NB: Some studies describe multiple (im)mobility undertakings.)

Aggregating the data into "Forced (Im)mobility" and "Voluntary (Im)mobility", we find that nearly all the studies identified forced (im)mobilities in receiving locations (94%). Twenty-four percent described voluntary (im)mobilities. (See Table 7)

Forced vs. Voluntary	**Forced (Im)mobility:** *Impact Response or Planned Survival (Im)mobility*		**Voluntary (Im)mobility:** *Strategic/Preventative or Aspirational (Im)mobility*	
Studies Referencing (17 in total)	16	94%	4	24%

Table 7: Forced vs. Voluntary (Im)mobility – Receiving Locations (NB: Some studies describe multiple (im)mobility undertakings.)

Supportive/enabling factors identified in studies of receiving locations

Referencing Table 5 again, forty-eight percent of receiving location studies described socioeconomic factors that supported resettlement needs and (im)mobility aspirations. Half of these identified social capital, in particular, kin-based translocal networks. Four studies (19%), all in urban areas, identified positive economic factors for some research participants, including adequate employment opportunities, the ability to accumulate modest savings, and good roads. One study linked better education and skillset levels to better livelihood opportunities (Sams, 2019).

One study found that climate-related migrant women in one particular urban slum had exercised an unusually high level of agency in their families' migration decisions, contrary to traditional gender role norms and expectations. That group of women also sought out favourable employment opportunities in garment factories near where they had settled, thus securing more reliable income streams than their male spouses. By defying traditional gender behavioural norms, this group of women helped secure better mobility outcomes for themselves and their families than most climate-related migrants and IDPs (Evertsen and van der Geest, 2020).

Burdensome/Inhibiting factors in studies of receiving locations

Twenty of the twenty-one studies (95%) described factors that adversely affected resettlement outcomes and inhibited (im)mobility aspirations in receiving locations.

Sixty-seven percent cited burdensome economic conditions. In rural receiving locations, lack of land and insufficient wage-based employment contributed to economic precarity. Many who resettled in rural areas, finding only low-paying seasonal or share-cropping agricultural work, spent much of the year unemployed. In urban receiving locations, many migrants and IDPs found limited and low-paying day labour, resulting in inadequate employment income for many. Some studies reported people taking multiple jobs (20%), including labour with high occupational risk (10%). Economic exploitation - wage theft and other exploitative practices - were reported (19%). Several studies observed that even migrants who took on multiple jobs struggled to accrue sufficient savings to return to their villages. Debt and poverty were common themes (49%). Insufficient education and skills and an absence of social safety nets were contributing factors (14%).

Fifteen of the twenty-one receiving-location studies (71%) reported inadequate shelter and WASH infrastructure. Studies of urban destinations reported that research participants had settled in slums or other informal settlements. Most of the urban and rural neighbourhoods and localities where migrants and IDPs had resettled were exposed to further climate-related hazards made more foreboding by inadequate shelter and WASH infrastructure.

Eight studies (21%) reported socioeconomic discrimination and exclusion. Trapped in insecure housing arrangements, migrants and IDPs often faced eviction threats and financial exploitation, including excessive potable water and cooking oil pricing. Along with the factors described above, this contributed to a heightened sense of human insecurity. In one study, that emotional stress, along with underemployment, was linked to increased intimate partner violence toward women (Sams, 2019).

Diminished food security also contributed to precarity. While one study mentioned an improvement in food security for some (Schwerdtle et al., 2021), a significant proportion of the sample noted food insecurity after resettlement (24%). The cost of food and poor food quality were listed as reasons.

Only two studies in the receiving-location sample (10%) discussed children's schooling. Both studies mentioned that a high percentage of children were kept out of school by their parents for financial reasons, so they could work to support their families (Amjad, 2019a, Hossain et al., 2020).

Fifty-two percent of receiving-location studies addressed health problems among climate IDPs and migrants. Similar to sending locations, vector-borne and water-borne diseases (often WASH-related) and heat-related illnesses were commonplace, disproportionately impacting children and other vulnerable groups. Mental health burdens were identified in three studies (14%), with two of these mentioning higher mental health burdens among women (Amjad, 2019b, Ayeb-Karlsson et al., 2020).

Barriers to accessing healthcare were noted in forty-three percent of the studies. Those barriers included cost (29%), availability of quality care (20%), distance to healthcare facilities (20%), and administrative complexity (10%). On the cost side, a study of healthcare-seeking behaviors found that climate-related migrants were significantly less likely to seek healthcare for their

children than non-climate migrants, resulting in significant child health burdens (Haque et al., 2019b). Another study, on the health disorders of rural-to-urban climate migrants, described migrant health as having significantly deteriorated after resettlement (Islam and Shamsuddoha, 2017).

Access to other public services was problematic in twenty-four percent of the studies. Additionally, two studies (10%) mentioned non-economic loss and damage – the death of family members and loss of community and culture – as burdensome, particularly to emotional and mental health.

Earlier it was mentioned that, in one study, certain behaviours outside of traditional gender norms had positively contributed to family and community mobility outcomes. However, that same study described how traditional gender dynamics cut the other way. Women undertaking mobility alone often faced social disapproval, leading some to delay their departure until environmental conditions had become so intolerable that mobility became forced. Lacking the support of a social network, many found themselves living on urban streets after displacement. Similarly, the high social price paid by women stepping out of their traditional roles discouraged many from seeking much-needed employment income, detrimentally impacting their well-being and that of their families (Evertsen and van der Geest, 2020).

4.6 Climate-Related (Im)mobilities and Outcomes

We now begin to consider the extent to which climate-related (im)mobilities in the dataset were 'adaptive'. As a reminder, this study follows IPCC's definition of "adaptation," which refers to "the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities" (IPCC, 2022a: p.2898).

"Adaptation" differs from mere "coping", which refers to "the use of available skills, resources and opportunities to address, manage and overcome adverse conditions, with the aim of achieving basic functioning of people, institutions, organisations and systems *in the short to medium term*" [emphasis added] (ibid, p.2904). "Maladaptation", on the other hand, refers to the "increased risk of adverse climate-related outcomes, including…increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future" (ibid, p.2915).

In the dataset, instances of adaptive climate-related migration are scarce. There are a few mentions of people who, by virtue of their relative wealth and education, could migrate voluntarily and resettle in supportive circumstances. However, such examples were presented as exceptions to the much more common challenges faced by the communities studied. Moreover, while the dataset does include instances where socioeconomic factors are conducive to adaptative migration, such as livelihood opportunities for women relocating near urban garment factories, on the whole, the lives of climate-related IDPs and migrants in the sample were defined by precarity after resettlement – environmental, health-related, and socioeconomic.

The data concerning voluntary non-migration in sending locations were more positive. There were a few examples of individuals and communities creating the conditions for voluntary non-

migration, mainly through the diversification of livelihoods, sometimes enabled by temporary or seasonal/circular mobility. However, in most studies, the broadly-felt aspiration "to stay" eventually gave way to forced mobility, often with human rights-eroding consequences.

Earlier, we noted a dearth in the academic literature of longitudinal studies in climate-related (im)mobility studies. It is, of course, reasonable to ask whether situations of climate-related precarity, such as those described in the studies, might eventually improve after the initial shocks and setbacks of climate-related (im)mobility. We will consider this now.

Erosive coping

As mentioned in the literature review, Warner and Afifi have used the term "erosive migration" to describe climate-related migration that fails to mitigate risk but leads to detrimental outcomes, such as increased food insecurity (Warner and Afifi, 2014). Similarly, other researchers have spoken of "erosive coping" behaviours, typically economic strategies undertaken in times of climate-related economic scarcity. Examples include reduced food consumption, reduced expenditure on healthcare and child education, and the sale of agricultural land to raise money for subsistence. Erosive coping behaviours negatively impact long-term economic well-being by diminishing financial assets, human health, or other requirements for livelihood sustainability (Quandt, 2021, Opondo, 2013). For the purposes of this paper, climate-related *erosive migration* is considered an example of a broader category of climate-related *erosive coping* behaviours.

This study's dataset suggests widespread erosive coping in both sending and receiving locations: reduction of food and fresh water consumption (Sultana et al., 2019, Hossain et al., 2020); keeping children out of school to support the family (Amjad, 2019a, Hossain et al., 2020); reduction in child healthcare-seeking behavior of parents (Haque et al., 2019b); the selling off of livestock due to the rising cost of animal feed, thereby eliminating an essential source of income and nutrition (Sams, 2019); and the use of livelihood-related microfinance for survival purposes, leading to unserviceable debt (Kabir et al., 2018).

In the dataset, erosive coping in sending locations often exacerbated pre-(im)mobility precarity, which, in turn, contributed to forced (im)mobilities. So, for example, some of those who exhausted their microfinance loans after a disaster to fund basic survival needs were subsequently compelled to migrate to repay – or escape – their debt burdens (Kabir et al., 2018, Schwerdtle et al., 2021). Similarly, the normative restrictions on women's climate-related mobilities in Bangladesh described above, though broadly considered supportive of household well-being, turned erosive for women who become trapped and unable to escape extreme weather events (Ayeb-Karlsson et al., 2020). Even women who managed to flee environmental hazards often didn't do so until the very last moment, with their mobilities taking the form of detrimental impact responses rather than planned strategic retreats (Evertsen and van der Geest, 2020).

Undoubtedly, the dataset's most pervasive form of erosive coping is relocation from climate-affected sending locations to environmentally exposed urban slums and rural poverty enclaves. In these receiving locations, environmental and other types of risk were exacerbated by poor housing, inadequate WASH, poverty, and an absence of social support and legal rights. Data

show that such precarious living environments often set the stage for further health, trauma, and socioeconomic challenges, particularly for more vulnerable groups.

Worsening precarity

Several studies showed precarity increasing over time for climate-related migrants and IDPs. One study evaluated the relative well-being of long-term climate migrants versus that of more recent arrivals, measuring the mental and emotional impact of migrants' lived experiences on a "Human Security Index" created by the author team (Adger et al., 2021). The index gauged human security in terms of psycho-emotional feelings of personal and family safety and health; economic prospects; environmental exposure; and the ability to exercise legal and social agency. The study found a strong correlation between the length of residence in the slum (some had lived there for more than ten years) and the extent of human insecurity. Repeated exposure to environmental hazards coupled with the mental and emotional toll of prolonged socioeconomic uncertainty had contributed to ever-worsening human insecurity. The human insecurity of long-term climate migrants and IDPs was similar to that of trapped populations.

Two other studies described climate IDPs and migrants who had become "newly trapped" – unable to leave the urban slums in which they had resettled. One found that involuntary immobility resulted from adverse "changes in water and food security, climate hazards, disease ecology, and the psychosocial impacts of disrupted livelihoods" (Schwerdtle et al., 2021: p.14). The other study described non-economic losses – identity, honour, sense of belonging and mental health – as contributing to psychosocial health burdens that affected mobility. Such "psychosocial constraints paralysed [climate migrants] mentally, as well as geographically" (Ayeb-Karlsson et al., 2020: p.1). The study also found that erosive (im)mobility was not limited to *involuntary* migration. Proclaimed the authors, "It is time that we acknowledge that not only people who are forced to migrate face eroding well-being, but also people who choose to migrate" (ibid., p.20).

The studies in the dataset included only limited mention of improvement in the well-being of climate IDPs and migrants over time. As mentioned, one study described how women's employment in garment factories positively impacted family well-being. Another study described families who had managed to secure steady livelihoods and experience a sense of upward social mobility. However, as previously noted, such examples were presented within these very studies as exceptions. More commonly, the dataset indicates growing precarity over time as the impact of erosive coping and continued hazard exposure undermined human well-being.

4.7 Vulnerability and exposure – undisrupted

Schwerdtle et al. observed that climate-related migrants and IDPs in Bangladesh, rather than describing "net negative" or "net positive" outcomes related to migration, told of "an exchange of hazards, exposures, and vulnerabilities at origin with those at destination, which challenged their capacity to adapt" (Schwerdtle et al., 2021: p.1). Returning to the data on factors impacting (im)mobility dynamics and outcomes, we can see how climate migration indeed involved a "risk exchange".

To give a simple example, some individuals and groups who migrated away from coastal areas due to sea level rise were able to reduce their exposure to water salinity. However, these migrants subsequently encountered WASH-related health challenges in their destinations. Their mobilities resulted in an "exchange" of one context-specific instance of precarity for another (e.g., water salinity in coastal sending locations for WASH-related health burdens in receiving locations). Precarity itself remained.

The broad categories of burdensome socioeconomic factors listed in Table 5 – poverty and other forms of economic disparity, social exclusion, health and healthcare challenges, inadequate shelter and physical infrastructure, and gender inequality – generally remained operative and consequential across sending and receiving locations on into post-(im)mobility phases. In the process, they often worsened:

- *Economic Factors*: Poverty, a vulnerability that increased climate-related risk, was often the cause of erosive coping, including erosive migration. For those who migrated, poverty continued to be the primary driver of socioeconomic precarity in receiving locations. Relatedly, we saw how debt in sending locations led to unplanned migration and was often a barrier to returning to one's place of origin. Additionally, the education or skillset gaps that hampered livelihood diversification in sending locations, thereby triggering displacement and migration, also made it difficult for climate IDPs and migrants to find jobs in receiving locations.
- *Social Exclusion*: Fear of eviction was a problem in sending locations for many who had lost land and livelihoods. It was even more common in receiving locations, especially in informal settlements where residency rights were often not recognized. Lack of legal recourse put climate migrants and IDPs at the mercy of landlords and local officials, leading to exploitative pricing for water, cooking fuel, and other basics.
- *Environmental Exposure:* In a high proportion of the studies, climate-related migrants and IDPs, having fled areas of environmental exposure, resettled in settings where they remained exposed to hazardous weather. For most poor migrants and IDPs undertaking autonomous mobility, there was an absence of safe, alternative mobility pathways and destinations supportive of well-being.
- *Health and Healthcare Access:* Over sixty percent of receiving location studies identified health and/or healthcare access as burdensome versus thirty-three percent of sending-location studies.
- *Gender:* Studies in the sample that applied a gender lens showed that gender both affected and was affected by (im)mobility pathways, choices, and outcomes. Gender dynamics were not universally portrayed as fixed or static, as we saw from the positive example of female agency leading to positive livelihood outcomes in one of the studies (Evertsen and van der Geest, 2020). However, in general, the database showed that gender dynamics often negatively impacted immobility outcomes, and vice versa, affecting the well-being of women and communities.

4.8 Revisiting the research questions

The research questions taken up in this paper are:

> *In what circumstances are climate-related (im)mobilities in Bangladesh genuinely adaptive? Under what conditions might human (im)mobility be maladaptive or merely short-term, non-adaptive, and unsustainable coping strategies?*

We recall the formula for climate-related impacts: *Risk = E*V/R* where *E* = Exposure, *V*=Vulnerability, and *R*=Resilience.

With only a few exceptions, *the (im)mobilities described in the dataset did not reduce exposure (E), reduce vulnerability (V), or create resiliencies (R) sufficiently enough to be considered 'adaptive'*. The five years of data show that most climate-related (im)mobilities in Bangladesh were autonomous and did not significantly reduce climate-related risk exposure for most socioeconomically marginalized people. *(Im)mobilities were often undertaken as coping strategies, but such coping strategies often proved unsustainable or even erosive over time,* according to the analysis of the various stages of the (im)mobility lifecycle.

Indeed, *autonomous climate-related (im)mobility frequently became maladaptive for those without resources or supportive mobility pathways.*

These findings do not and should not discredit the *potential* for human (im)mobility in climate change adaptation. The few exceptions in the dataset – successful voluntary non-migration through livelihood diversification aided by translocality and the adaptive benefits of changes in gender dynamics – are all encouraging examples of resilience-building. However, this study's findings show that involuntary and unsupported (im)mobility of vulnerable populations is problematic. Human (im)mobility in such circumstances needs to be supported proactively through climate adaptation policies and DRR interventions.

5. Conclusion: Revisiting (im)mobility and adaptation

5.1 The evolution of this meta-study

When this study was conceived, the intended research focus was *urban-to-rural migration* as an adaptation strategy in Bangladesh. This author's interest in that specific form of human (im)mobility stemmed from concerns over the challenges of rapid growth in urban in-migration hotspots in Bangladesh and elsewhere, fuelled and exacerbated by climate change.

However, in the project's initial theoretical research stage, conceptual insights from human (im)mobility scholars, including Zickgraf and Farbotko, persuaded this author to broaden the research focus. This author realized the importance of considering both mobility and (im)mobility. This author also saw how translocality – the simultaneous embeddedness of families and communities in multiple localities – was often a normal part of rural life and, therefore, important to the climate (im)mobility landscape (Etzold and Mallick, 2016). Human (im)mobility could also be seen as "relational", where the mobilities of some people often depended upon and sometimes enabled the (im)mobilities of others (Zickgraf, 2022). It became clear that understanding any one instance or type of climate-related (im)mobility (for example, rural-to-urban climate-related migration) would be enhanced through consideration of the larger

plurality of (im)mobilities to which it belonged. Thus, the study's scope was expanded to include all climate-related (im)mobilities in Bangladesh, not just rural-to-urban migration.

That shift enabled a greater contextual richness. It also provided a broader vista that led to this study's main observations:

- Socioeconomic vulnerability was common across a variety of climate-related (im)mobility contexts, including sending and receiving locations, both rural and urban.
- Vulnerability shaped (im)mobility dynamics at all points of the (im)mobility cycle.
- Because the (im)mobilities in the sample were always autonomous and usually involuntary, vulnerability rarely improved through (im)mobility. On the contrary, vulnerability often increased.
- The human rights-based support for IDPs envisaged in the Guiding Principles for Internal Displacement (OHCHR, 1998) and the Sendai Framework for Disaster Risk Reduction 2015–2030 (UNDRR, 2015) – preventative interventions pre-displacement; protective interventions during displacement; and durable solutions post-displacement – was generally not on offer.

5.2 Climate-related (im)mobility policy in Bangladesh

That autonomous (im)mobility does not, on its own, resolve the socioeconomic vulnerabilities that amplify the adverse effects of climate change is not surprising. What is surprising, however, is the relative "back seat" that internal displacement has taken in GoB climate adaptation policy thus far, including in the recently adopted NAP. It seems at odds with Bangladesh's reputation as a leader in mainstreaming climate adaptation into policy; the country's commitments under several international displacement, DRR, and human rights frameworks; and what is otherwise a very genuine and determined attempt by the GoB and civil society to address the impacts of climate change on the nation and its people.

Several scholars have argued that a low prioritization of human rights by the GoB plus weak institutional capacity are to blame for the insufficient effort to address climate-related involuntary (im)mobility (Naser et al., 2019, Khan, 2019, Barua et al., 2017). Others, more critically, have suggested that a failure to address socioeconomic factors contributing to involuntary (im)mobilities reflects a deliberate de-politicization of climate change impacts in Bangladesh. They've argued that the root causes of climate vulnerability – landlessness, income inequality, and lack of legal and social rights – have been intentionally sidestepped for purposes of power and privilege (Paprocki, 2015, Hasan and Evertsen, 2021). Hasan and Evertsen have also suggested that international and national development actors and their donors are partly to blame – for trading their "acquiescence" for the ability to continue their work in the country (ibid.).

Such criticism seems harsh – or at least outdated – given the inclusion of several rights-supporting initiatives in the NAP, as highlighted in *Chapter 1*, and especially given the progress made on another policy front – the National Strategy on Internal Displacement Management (MoDMR, 2021), a human rights-based approach to supporting climate-related IDPs in Bangladesh. Developed and championed by the Refugee and Migratory Movements Research

Unit (RMMRU) over the past several years, the National Strategy on Internal Displacement Management (NSIDM), drawing on the Guiding Principles, the Sendai Framework and the Sustainable Development Goals (UNGA, 2015), calls for the support of IDPs throughout the displacement cycle. Displacement phases include *pre-displacement*; *during displacement* (from the time of displacement to resettlement); and *post-displacement* (from resettlement through to the provision of durable solutions). The strategy targets the needs of particularly vulnerable groups. It proposes initiatives, including socioeconomic interventions and legal protections, to build human rights-affirming capabilities to help prevent, minimize, and address the adverse impacts of climate-related displacement. Initially slow to gain traction within the government, the NSIDM has now been adopted by the Ministry of Disaster Management and Relief (MoDMR), which, together with RMMRU, has released a detailed action plan with input from twenty-seven different ministries and agencies (MoDMR, 2022).[10]

The challenge now is to move the NSIDM beyond its current single-ministry, non-binding *strategy status* to an all-of-government *policy framework* for climate-related internal displacement. It is unfortunate that Bangladesh's National Adaptation Plan (MoEFCC, 2022), which was spearheaded by a separate bureaucracy, the Ministry of Environment, Forest and Climate Change in collaboration with UNDP, didn't take this up and further mainstream NSIDM strategies in climate adaptation policy. It would seem that organizational silos and competing priorities – both within the GoB and between international agencies responsible for addressing the impacts of climate change – are at least partly to blame for the peripheral treatment of displacement in the NAP. It would seem that the separate bureaucracies responsible for climate change adaptation, disaster risk reduction, and economic development need to align – or even consolidate.

On a more empathetic note, it should be acknowledged that the scale of forced (im)mobility in Bangladesh is daunting. Moreover, forced (im)mobility is not the only major climate-related impact stressing the nation. Bangladesh already spends six to seven percent of its annual budget on climate adaptation (Outlook India, 2022). The country also incurs an estimated $3 billion (about 1% of GDP) of direct losses due to climate change (WorldBank, 2021), much of that by poor rural residents, the 'silent financiers' of climate change damage (Hossain, 2021). In the run-up to COP 27 (Sharm El-Sheikh, 2022), Bangladesh's Prime Minister decried the failure of countries in the Global North to fulfil their existing climate adaptation funding commitments to low-emissions developing nations unjustly suffering the consequences of climate change. PM Sheikh Hasina also sharply criticized the slow progress toward establishing a fund for loss and damage for developing countries (Outlook India, 2022).

Furthermore, although COP 27 progressed discussions on loss and damage funding, the United States, the largest greenhouse gas emitting nation historically, has taken a backward step since COP 27 concerning its climate finance commitments. In late 2022, the US reneged on previous funding commitments to developing nations that date back to COP 21 (Paris, 2015), with the US

[10] RMMRU published a predecessor to the NSIDM, called National Strategy on the Management of Disaster and Climate Induced Internal Displacement (NSMDCIID) (MoDRR, 2015). It was never adopted by the GoB (Siddiqui et al., 2018). However, the strategy was revised in 2020 (RMMRU, 2020) and subsequently adopted by the MoDMR under the name, the National Strategy on Internal Displacement Management (NSIDM).

congress budgeting only $1 billion to fund climate adaptation and mitigation in 2023. This is well short of the $11.4 billion per year pledged by President Biden (Milman, 2022). Noting that Biden's pledge of $11.4 billion was already well below the US's fair share of climate adaptation funding, Saleemul Huq, director of the Dhaka-based International Centre for Climate Change and Development (ICCCAD), referred to the $1 billion budgeted by the US congress as "an insult to developing countries" (ibid.). Sadly, climate change adaptation remains a grossly underfunded mandate in Bangladesh and globally, leaving developing nations struggling and countless climate-related IDPs to fend for themselves.

5.3 The 'migration as adaptation' discourse

Much has been made in the academic literature about the context-specificity and multicausality of climate-related (im)mobility. Such insights have been valuable on several levels – such as highlighting migrant agency and in contesting the lingering influence of environmentally deterministic and securitized views. This author, however, wonders if the discourse has strayed too far from attribution and accountability. Socioeconomically marginalized groups, communities, and nations suffer the worst consequences of climate change even though, in general, they are not to blame for climate change. Moreover, the insights that climate-related (im)mobilities fall somewhere on a spectrum between "forced" and "voluntary" and are attributable to more than just climate change shouldn't free governments from their responsibilities. Nor should they let major polluters off the hook.

In their introductory article for a special issue on climate mobilities for the *Journal of Ethnic and Migration Studies*, Boas et al. state:

> The discourse of apocalyptic climate change-induced mass migration is now past its prime. Particularly since the early 2010s, it has been extensively critiqued…and the majority of migration scholarship no longer expects a linear, massive and world-transforming movement of people under climate change (Boas et al., 2022b: p.3365).

The findings of this study support this position. They also suggest that another discourse on climate-related (im)mobility may be past its prime, or at least in need of extensive qualification – that of 'migration as adaptation'.

Most obviously, the word *migration* doesn't capture the plurality of climate-related human (im)mobilities – including potentially beneficial (im)mobility strategies such as circular mobility and translocality. Moreover, as we've seen, autonomous, coerced, and unaided (im)mobility is often no solution to climate change's adverse impacts. For people already dealing with socioeconomic vulnerabilities made worse by climate change, being forced to move, or stay, particularly when there are few supportive pathways available, is simply not conducive to positive outcomes. Even when movement isn't forced, vulnerability and exposure in unsupportive receiving locations can lead to further erosion of well-being.

Nearly all of the research articles in the dataset confirm the *context-specificity* of climate change impacts, including climate-related (im)mobility. However, they also reveal a *commonality* across (im)mobility contexts – the prevalence of socioeconomic vulnerability. Socioeconomic

vulnerability contributed to (im)mobility, remained largely unresolved by (im)mobility, and was frequently exacerbated by it. Additionally, most of the mobilities described in the database involved significant levels of involuntariness. It is appropriate to label them *internal displacements*. Forced mobilities and immobilities should trigger legal and moral obligations.

If the goal is to reduce forced (im)mobility and support climate adaptation, then the socioeconomic drivers of vulnerability must be called out and addressed. As Oliver-Smith wryly observes:

> In effect, part of what people may be adapting to in climate change is precisely the systemic vulnerability imposed by society. Is adaptation, as it is being currently framed, about adjusting so the status quo can persist? Basically, the question becomes: What is being adapted to? Climate change or a system of structural disadvantage, perhaps made worse by climate change? In effect, the problems of the poor and vulnerable do not begin with climate change. They may be made substantially worse by climate change, but limiting interventions to dealing with climatic effects fails to systemically address imposed social vulnerability (2016: p.64).

We should not let human vulnerability and displacement become decontextualized or depoliticized by our conceptual debates, in the search for technical solutions, or by a desire to remain relevant.

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Note: Primary Data references may be found below on page 50.

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