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An integrated governance framework to map out and act on the interrelationships between human mobility and disaster risk

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ABSTRACT

In modern complex societies with profoundly interlinked sectors and sub-sectors, policymakers and scholars need to adopt systemic thinking as an analytical lens for mapping the intersections and interdependencies between social systems and their related vulnerabilities. This paper argues for an integrated governance approach to manage the risks and opportunities arising from the interactions between human mobility (HM) and disaster risk (DR). The analysis of HM and DR governance frameworks at the international and national levels (including through the case study lens of Bangladesh) shows that some progress has been made in integrating aspects of HM into DR governance and vice versa. Although respective frameworks have been integrated to a certain extent, further points of convergence and overlap still need to be adequately addressed. The policy integration process can be guided and facilitated by combining two conceptual frameworks originating in the HM and DR governance fields: the human mobilities perspective and the systemic risk approach. The paper concludes by proposing an HM-DR governance framework informed by these perspectives and steered by an interagency standing committee.

KEYWORDS

Human (im)mobility ; disaster risk; integrated governance; systemic risk; systems thinking

Introduction

As we move toward more complex societies with profoundly interlinked sectors and sub-sectors, we need more targeted policy instruments and legal frameworks to better support our collective challenges. As highlighted by the Special Issue's Introduction (Tagliacozzo, Pisacane and Kilkey 2023) in such a context, it is compelling for policymakers and scholars to adopt systems thinking as an analytical lens for mapping the intersections and interdependencies between social systems and their related vulnerabilities (UNDRR 2022a; UNEP 2023). However, attending to and acting upon these intersections means

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not only mapping out systems' dependencies and conditionalities but also applying an integrated governance approach, whereby policies, frameworks, strategies, and plans developed to solve challenges in a societal domain or in systems are re-formulated, adjusted and extended to other areas through purposive cross-sector integration processes. Embracing this perspective, the current paper addresses the intersections between the societal realms of human mobility (HM) and disaster risk (DR) governance by looking at how DR governance measures are approached in HM policies and practices and how HM governance concepts are included in DR governance frameworks (Fakhruddin & Sims 2021), both in international policy frameworks and national approaches. Furthermore, we argue that this integration process can be guided and facilitated by the combination of two different approaches originating in the DR and HM governance fields, respectively: the systemic risk approach (Schwezer 2021) and the human mobilities perspective (Wiegel et al. 2019).

The former departs from the concept of systemic risk that, as opposed to conventional risks, which present a more linear cause–effect relationship, can generate repercussions or complete breakdowns in several societal systems, often far from the system of origin through ramified knock-on effects (IRGC 2018; Renn et al. 2022). From a systemic risk perspective, it is critical to review '*how linkages and nested relationships with other systems leave one vulnerable to cascading failure and systemic threat*' (Linkov et al. 2019, 9). For example, gaps in migration policies can generate staff shortages in critical sectors with a large share of migrant workforce (e.g. agriculture), significantly affecting their functioning (Tagliacozzo, Pisacane & Kilkey 2020; see also Corrado, Pisacane, and Ferrari 2023 in this Special Issue). This may impact a nation's food security and, in turn, endanger national public health. Several societal sectors can be captured in this negative spiral without systemic interventions.

Compared to migration scholarship, a mobilities approach (Scheller & Urry 2016; Wiegel et al. 2019) adopts a broader perspective, interrogating the power relationships behind the governance of mobility and immobility and challenging the migration narrative, which neglects research into the potential vulnerabilities that may surround immobility (Wiegel et al. 2019; Schewel 2019). Against this framework, human (im)mobility (HM) denotes a range of mobility outcomes (including immobility or entrapment) on a continuum that goes from voluntary to forced (such as environmental migration and disaster displacement) (Guadagno 2017). A mobilities approach considers (im)mobility as a function of both the capability and the aspiration to move of the individual ('aspiration-capability framework') (Schewel 2019), de-exceptionalising the migration decision (e.g. moving solely because of adverse circumstances) (Boas et al. 2022) and highlighting the voluntariness of 'staying in place' despite risks (Wiegel et al. 2021).

Numerous studies and reports have illuminated the relationships and mutual influences between HM and DR. Yet, integrated approaches to address the risks and seize the resilience opportunities emanating from these interactions still need to be fully developed. Integration can occur in several dimensions and at various scales (e.g. institutions, policies, operations, data and knowledge management and budgeting at local, national, and supranational levels) (Fakhruddin & Sims 2021); this paper focuses mainly on the policy dimension which sets out the foundation for systemic governance. In this respect, it mainly addresses challenges related to the domain of migration regimes at the macro-level (e.g. it does not tackle the individual experiences of disaster-

induced migrants). At the same time, the paper still spotlights some aspects of the broader migration system by, for example, elaborating on the interactions and influences between migration and disaster risk governance institutions and on the impacts of the policies in one system on the components of the other. In terms of contribution to this Special Issue's objectives, understanding the relationships between migration systems and disaster risk governance is relevant for several reasons. On the one hand, disasters, such as pandemics or wars, represent external shocks that may alter migration flows and the functioning of migration institutions, links and agreements (see the exogeneous level as represented in Figure 1 of the Special Issue's introduction). In this sense, disasters are part of that wider environment that can shape the internal and external interactions of the migration system. On the other hand, disaster risk governance is a system *per se* with its own rules, actors and purposes that interact with those of the migration system. In other words, disaster risk governance acts on a double level: as one of the systems that interact with the migration system (at the meso-level) and as an element possibly altering the relationships between migration systems and other connected systems (at the exogenous level). This double role makes it difficult to disentangle the relationships created by disaster risk management as a system or as a way to govern disturbances of external shocks on the interactions between societal systems.

In this paper, we focus on disaster risk governance as a system which interfaces with other systems including migration. We argue that a single governance framework makes it possible to target, through appropriate interventions, the areas of intersection and convergence of risks and opportunities created within both the DR and HM societal realms. To develop this argument, we first elaborate on the multiple areas of interdependency between HM and DR and the inherent complexity of these interactions. We then evaluate the extent to which policy frameworks concerning DR and HM have been integrated into international policy discourses. We further dig into our analysis by focusing on the national case study of Bangladesh, where migration (both internal and cross-border) and disasters represent critical issues. Finally, we highlight gaps in existing integration efforts and propose a single governance framework informed by the perspectives of systemic risk and human mobilities.

1. Understanding the interdependencies between human mobility and disaster risk

Mapping the interplay between the HM and DR governance systems means understanding the social, legal and environmental implications of HM policies and practices on increasing or reducing disaster risks for specific groups or individuals while simultaneously accounting for the HM outcomes of policies and practices aimed at DRR.

The interplay between human (im)mobility and DR, creation and reduction, reveals that demographic patterns can shape people's resilience and vulnerability (Donner & Rodriguez 2008). On one hand, moving can improve migrants' life and economic prospects by facilitating the exchange, sharing and circulation of resources, goods, and ideas with evident positive outcomes for sending and receiving communities (Martin et al. 2018; Tagliacozzo, Guadagno & Ayeb-Karlsson 2022). On the other hand, demographic pressures and increased concentration of the population due to migrants' inflows in hazards-prone countries or areas can magnify the number of people and

assets exposed to a hazard (e.g. an earthquake), possibly leading to increased fatality and loss rates when the hazard occurs (Wilson and Paradise 2018).

In many cases, HM can produce a paradoxical effect by reducing risk in one area whilst increasing it in another (*risk redistribution*). For example, de Sherbinin et al. (2012) noted that people tend to move out of drylands and mountain areas (more prone to drought) toward coastal zones that are often subjected to floods and cyclones. Similarly, economic and environmental challenges can push people away from rural areas toward urban centers, which become hotspots for disaster risks and social insecurity due to the dire living conditions of the poorest segments of the population (of which migrants often represent a sizable part) mainly concentrating in hazard-prone neighborhoods (Haque et al. 2018). Without adequate governance and urban planning, rural-urban mobility can lead to risk accumulation in urban environments (Ayeb-Karlsson & Uy 2022; McNamara, Olson, and Rahman 2016).

Even if HM can generate several adverse cascading and compounding impacts, it is also to be regarded as an adaptive strategy that allows people to step away from difficulties and pursue better economic and life quality prospects (Guadagno 2017; Benveniste et al. 2020). For example, seasonal and circular migration is a way to diversify households' livelihoods and can increase the resilience of populations through remittances (Adger et al. 2018). Therefore, more recently, scholars have also started to interrogate what happens when mobility is constrained due to the lack of economic capability, social support or policy-related restrictions (Black et al., 2013; Ayeb-Karlsson et al. 2018). Benveniste et al. (2020) demonstrated quantitatively that policies forcing people into involuntary immobility can curtail their ability to apply coping and adaptation strategies, such as migrating in response to climate-related hazards, making migrants and sending and receiving communities more exposed and vulnerable to climate change impacts. The notion of 'trapped populations' draws attention to the fact that those who desire to move but are unable to do so and therefore remain stuck in a risky environment can be just as or more vulnerable than those who move (Foresight 2011; Black et al. 2013; Adger et al. 2018; Ayeb-Karlsson et al. 2018). Restrictionist migration policies generate immobilizing regimes (Merla et al. 2020) that have detrimental impacts on the well-being and security of both those who stay behind and those who have already moved (e.g. through the limitation of transnational care opportunities among family networks – see Kilkey & Baldassar 2023 and Hussein, Kilkey, and Tawodzera 2023 in this Special Issue).

Immobility by choice can however represent an adaptive strategy (Khatun et al. 2022). Indeed, it is important to consider the possibility of moving as well as the motivations. Some people may be unwilling to move despite the risks faced in the living contexts (Mallick and Schanze 2020). Motivations for voluntary immobility can be multiple and link back to attractive conditions at home that bolster the preference to stay (retain factors), conditions in destination countries elsewhere that diminish the aspiration to migrate (repel factors) and internal constraints to migration (Schewel 2019). Gender norms, and other social roles, for example, often involve a set of socio-culturalinner beliefs, values and emotions (e.g. patriarchy, feelings of belonging, attachment, modesty) that can refrain women from moving even when exposed to high environmental risks (Ayeb-Karlsson 2020). In societal and cultural contexts where gender roles are rigidly segregated women tend to cope with the immobility imposed by gender norms by maintaining an optimistic outlook on climate risks and renegotiating

their role within the patriarchal boundaries (Tripathy Furlong et al. 2022). Adding to this, a growing stream of climate change literature has started challenging the linear relationship between climate change effects and so-called 'mass migration' (Boas et al. 2022), highlighting that some populations may not consider climate change-induced risks a sufficient reason to migrate (Wiegel et al. 2021).

From a policy standpoint, the interlinkages highlighted above beg questioning through which mechanisms HM policies can amplify or reduce disaster risk. This question needs to be addressed more in the literature. For example, Adger et al. (2018) point out that if governance processes proactively plan for migration by creating favorable conditions for voluntary movement, pathways to positive outcomes are produced. Other mechanisms triggering positive feedback loops concern the provision of welfare and social and economic support for poor and marginalized groups, especially in urban (destination) and hazard-prone (origin) areas. This can reduce potential tensions between migrant and receiving communities based on human rights-centered policies that promote collaboration and enhances a sense of collective belonging (Black et al. 2013; Adger et al. 2018). Talking about internally displaced people (IDPs), the HLP-IDP report (2021) calls for governments to search for and adopt durable solutions, referring to sustainable solutions that enhance the ability of '*IDPs to reintegrate into society and reach a point where they no longer have needs associated with being displaced*' (8). To achieve this, we must embrace a holistic and whole-of-displacement approach that considers the distinct needs, experiences, and decisions to settle down or to move for diverse (but often intersecting) reasons.

There is a need for human (im)mobility policies to consider concepts related to risk management and reduction. Adding to this, there is scope for integrating HM issues (e.g. migration, displacement, and immobility, both voluntary and involuntary) into DR assessment, planning and management (Desai et al. 2021). This can involve considering the impacts (e.g. financial and human costs), also at long-term and long-distance, of disaster-related displacement (including that triggered by slow-onset disasters). Apart from unplanned displacements, DRR policies can also arrange for the assisted migration of individuals (or some claim entire settlements) from hazard-prone environments toward safer areas. However, scholars have repeatedly questioned how these interventions can reduce disaster risk longer terms as people tend to have unique needs, desires and aspirations. The empirical evidence from diverse contexts similarly proves that large scale relocation and resettlement tend to be unsuccessful and sometimes even harmful (Oliver-Smith 1991; Kothari 2014; Ayeb-Karlsson, Smith, and Kniveton 2018; Ayeb-Karlsson, Baldwin, and Kniveton 2022). In many cases, planned resettlement modifies urban footprint, disrupts community networks, and leads to social and urban fragmentation, making relocated people more vulnerable to disasters (Kondo & Lizarralde 2021). This prompts the question of which DRR mechanisms and policies that can be 'maladaptive', referring to the '*result of an intentional adaptation policy or measure directly increasing vulnerability for the targeted and/or external actor(s), and/or eroding preconditions for sustainable development by indirectly increasing society's vulnerability*' (Juhola et al. 2016, 139). Johnson et al. (2022) proposes the notion of 'cascading displacement' to describe how the relocation of some groups for DRR purposes can lead to further increased insecurity, displacement (or fear of displacement) of the individuals inhabiting the relocation site. Risk may also be created through the misuse of

the 'vulnerability' labels to justify assigning humanitarian aid to specific groups (e.g. forced migrants) while excluding other individuals, such as those belonging to the receiving populations, from the right to receive assistance (Sözer 2020). These examples demonstrate that in some instances, DRR policies, rather than reducing risk, can redistribute it to other areas and segments of the population. Another mechanism of risk creation pertains to the exclusion of migrants from DRR policies and practices of the receiving countries. Although this exclusion may not necessarily be deliberate, it often reflects the lack of acknowledgement that migrants face specific challenges when coping with disaster situations in a foreign nation (Guadagno et al. 2017). Finally, post-disaster recovery policies can also shape the working opportunities and conditions of migrant workers. Post-disaster recovery activities and the out-migration of locals generate employment opportunities and niches (e.g. in the construction industry) that can be quickly filled by migrant workers (How & Kerr 2019). Research evidence, however, demonstrates that migrants are largely more represented in lower wages and precarious positions in recovery settings which further intensify their pre-existing vulnerabilities (Sisk and Bakston III 2014).

2. Realizing the integration between HM and DR governance in international policy frameworks

In recognition of the interactions between HM and DR, over the last decade, global policy discussions and instruments have increasingly addressed HM and DR issues in a convergent and coherent fashion. On the one hand, migration, displacement, and planned relocation have become central concerns for global dialogues on DRR, climate action and humanitarian interventions. On the other hand, disasters and disaster risk (including climate risk) have prominently been featured in all policy and work streams related to HM. This parallel evolution has led to cross-fertilization across processes and frameworks and resulted in significant overlapping discussions.

2.1. Integration of HM in DRR and climate policy

This progress of integration started within the climate policy arena. The UNFCCC's 2010 Cancun Adaptation Framework, in paragraph 14.f, was already calling for an enhanced understanding, coordination and cooperation related to climate change-induced displacement, migration and planned relocation (Warner 2012). The mobility implications of climate change have since partly been concentrated under the umbrella of Loss and Damage discussions, starting during the 2012 COP18 in Doha (decision 3.CP/18, paragraph 7.a.vi) (IOM 2018b).

The relevance of migration, displacement, and relocation topics for global environmental policy discussions was reaffirmed by DRR actors. The Sendai Framework for Disaster Risk Reduction (SFDRR), approved in 2015, is the first DRR framework to take a comprehensive approach to HM topics. It recognizes migrants as agents of resilience for their wider collectives of origin and destination (paragraphs 7 and 36.a.vi). It calls for their engagement in the design and implementation of DRR efforts (paragraph 27.h). It references the need to prepare for evacuations and managed displacement in the context of disasters (33.h and m), including transboundary movements (28.d). It

also highlights the need to address disaster-induced mobility in ways that build the resilience of the people on the move and their hosts (paragraph 30.l) and refers to planned relocations from hazard-prone areas to protect people and assets (27.k) (Guadagno 2016; Yonetani 2018).

Shortly after the launch of the SFDRR, further integration of mobility and environmental issues was reached with the 2015 Paris Agreement. At COP21, UNFCCC parties established the Task Force on Displacement (TFD)[1], aiming to develop recommendations to avert, minimize and address displacement related to the adverse impacts of climate change. Since its establishment, the TFD has been exploring ways to promote knowledge, policy, and operation support on HM as part of climate action (UNFCCC 2019). This work has made mobility concerns integral to the work plan of the Warsaw International Mechanism for Loss and Damage and the ongoing discussions on the assistance provided through the Santiago Network (IOM 2018a).

In parallel, UNDRR has stressed the need to integrate displacement issues within DRR strategies and programs as part of national efforts to implement the Sendai Framework. Relevant guidance has been produced through the publication of a Words into Action guide on disaster displacement and related policy and capacity-building work (UNDRR 2019b). Likewise, as we shall articulate in the following paragraphs, there is scope for integrating disaster and climate change-induced issues in HM policies.

2.2. Integration of disasters and climate within HM policy streams

Disasters and climate change impacts have long been recognized as critical topics in displacement, migration, and planned relocation discussions. The Global Forum for Migration and Development (GFMD) acknowledged environmental events and processes as drivers of migration during its first Summit in 2008 (GFMD 2008). Over the last few years, relevant issues have gained extensive prominence for processes traditionally more focused on people moving due to conflict or for economic reasons. Key to these developments has been the work under the Nansen Initiative Agenda for the Protection of Persons Displaced Across Borders in the Context of Disasters and Climate Change (Nansen Initiative 2015). The document was endorsed in 2015 by over 100 States and is now being pushed forward by the Platform on Disaster Displacement (PDD) through policy, advocacy, and operational efforts.

The most relevant development is the Global Compact for Migration (GCM), the first international policy framework on migration, negotiated in 2018. Although a non-binding document, the GCM dedicates an entire section of its Objective 2 to minimizing the adverse environmental drivers compelling people to leave their countries of origin. The GCM also highlights the need for common pathways from affected areas and the principle of avoiding returns towards risky areas, among other topics relevant to the HM and environment nexus (e.g. Martin et al. 2018). In addition, the GCM text specifically mentions strengthening data and analytical capacities on movements in disasters, the need to implement DRR and climate change adaptation (CCA) programs, and disaster planning that integrates displacement considerations to reduce the pressures leading to population movements. It also calls for coherence in addressing the challenges stemming from population movements in the context of disasters (UN 2018).

In addition, disasters and the impacts of climate change have been prominently covered as part of the celebrations for the 20th anniversary of the Guiding Principles on Internal Displacement (GP20 2018). Furthermore, they have been made the object of a thematic report by the Special Rapporteur on the human rights of internally displaced persons (UN 2020). Most recently, environmental issues have received ample visibility in the UN Secretary-General's High-Level Panel on Internal Displacement (HLP-IDP 2021) and its final report, which informs the implementation of the SG Action Agenda on Internal Displacement.

2.3. National and regional level

Convergence and integration of HM and environmental issues have been pursued at regional and national levels. Environmental concerns are factored into an increasing number of policies dealing with displacement and migration (such as Vanuatu's National Policy on disaster and climate-induced displacement), while references to displacement, migration and relocation concerns are recurring in National Adaptation Plans and Strategies, Nationally Determined Contributions, and national DRR strategies and policies (Yonetani 2018; IOM 2018b).

Policy discussions within regional fora on migration and regional frameworks on migration, including free movement agreements, have given ample consideration to population movements in the context of disasters, environmental degradation and climate change. At the same time, regional DRM bodies, frameworks and discussions increasingly look at the regional implications of migration and displacement for DRR. For instance, following President Biden's Executive Order (E.O.) 14013 '*Rebuilding and Enhancing Programs to Resettle Refugees and Planning for the Impact of Climate Change on Migration*', the White House issued a report looking at the interlinkages between climate change and migration and advising on the establishment of a standing interagency policy process on Climate Change and Migration (White House 2021).

2.4. Gaps and issues

Integrating themes and issues related to mobility and the environment has been advancing in parallel across different policy streams. While this is undoubtedly a positive sign of increasing centrality of the case for a diverse set of global, regional and national bodies and processes, it can also translate into duplications of efforts and inconsistencies – both as part of the policy dialogues mentioned above and more importantly, at the operational level, through overlapping or contradicting implementation, data and monitoring activities when relevant policies are rolled out.

Over the past few years and following the launch of the Sendai Framework, the focus has increasingly concentrated on displacement and forced migration – as shown, for instance, by the emergence of the Platform on Disaster Displacement and the Task Force on Displacement, as well as work by UNDRR (2019a), the SRSG-IDP (UN 2020), or the prominence of environmental drivers of migration within the Global Compact (UN 2018). This process has also translated into the loss of visibility of other complementary issues, such as the resilience and adaptation

benefits of moving, the role of migrants supporting risk reduction objectives, and the relevance of population movements as dynamics of disaster risk creation and reduction, which are all critical facets of the mobility-and-disaster prism from a DRR standpoint (Guadagno 2016).

3. Realizing the integration between HM and DR governance in national contexts: a case study from Bangladesh

Apart from international frameworks, looking at HM and DR policy streams nationally is also relevant to verifying the cross-fertilization level. Here we use Bangladesh as a case study to illustrate the importance of an integrated governance approach to manage overall country-level risk. In addition, this section looks explicitly at internal migration (e.g. climate mobility, rural-urban migration, and/or immobility) to further the understanding of the relations between HM and DR governance.

3.1. Bangladesh's journey towards disaster resilience

Bangladesh, with a population of over 165 million people, is one of the world's most disaster-prone and densely populated countries. Bangladesh has always been a classic case study for DRR and climate mobility studies (Haque and Zaman 1989) due to its unique demographical, geographical, and geomorphological characteristics (Sammonds et al. 2021; Ayeb-Karlsson et al. 2016) and frequent rapid and slow onset disasters such as monsoon floods, tropical cyclones, river and coastal erosion, salinity intrusion, water scarcity and drought, and sea level rise (Figure 1).

Historically, hydrometeorological disasters such as droughts and cyclones in the Indian sub-continent, particularly present-day Bangladesh, have been critical for catastrophic human suffering. For example, tropical cyclones turned into tragic disasters on numerous occasions in the southern coastal region of Bangladesh. As stated in the Imperial Gazetteer of India (v. 6, pp. 166 and 168), the population of today's Barisal division was significantly reduced between 1872 and 1881 by the disastrous cyclone of 1876 that was submerged to a depth of from 10 to 40 feet. As a result, nearly a quarter million people drowned or died in the ensuing cholera epidemic (The Imperial Gazetteer of India 1909). The root causes of these disasters were the result of long-standing policies undertaken by the East India Company and later the British Raj to deforest the tiger-infested Sundarbans mangrove forests systematically since 1783, promoting agriculture (paddy fields by wiping out traditional weaving and salt industry) for supplementing increased tax revenues in the region, incentivising human settlements in the coast, and creating economic and political divisions within the Bengali society (Kingsbury 2018).

During the Pakistan era, the 1970 Cyclone killed about half a million people in Bangladesh (then East Pakistan), one of the deadliest cyclones ever recorded. Despite having a bitter past, at present, Bangladesh's collective resilience to cyclone disasters is portrayed worldwide as a success story. Indeed, in contrast with the previous death figure, the 2020 Cyclone Amphan, even with a higher wind speed and storm surge height, caused only 15 fatalities (American Red Cross, 2020). Since the country's independence in 1971, the Government

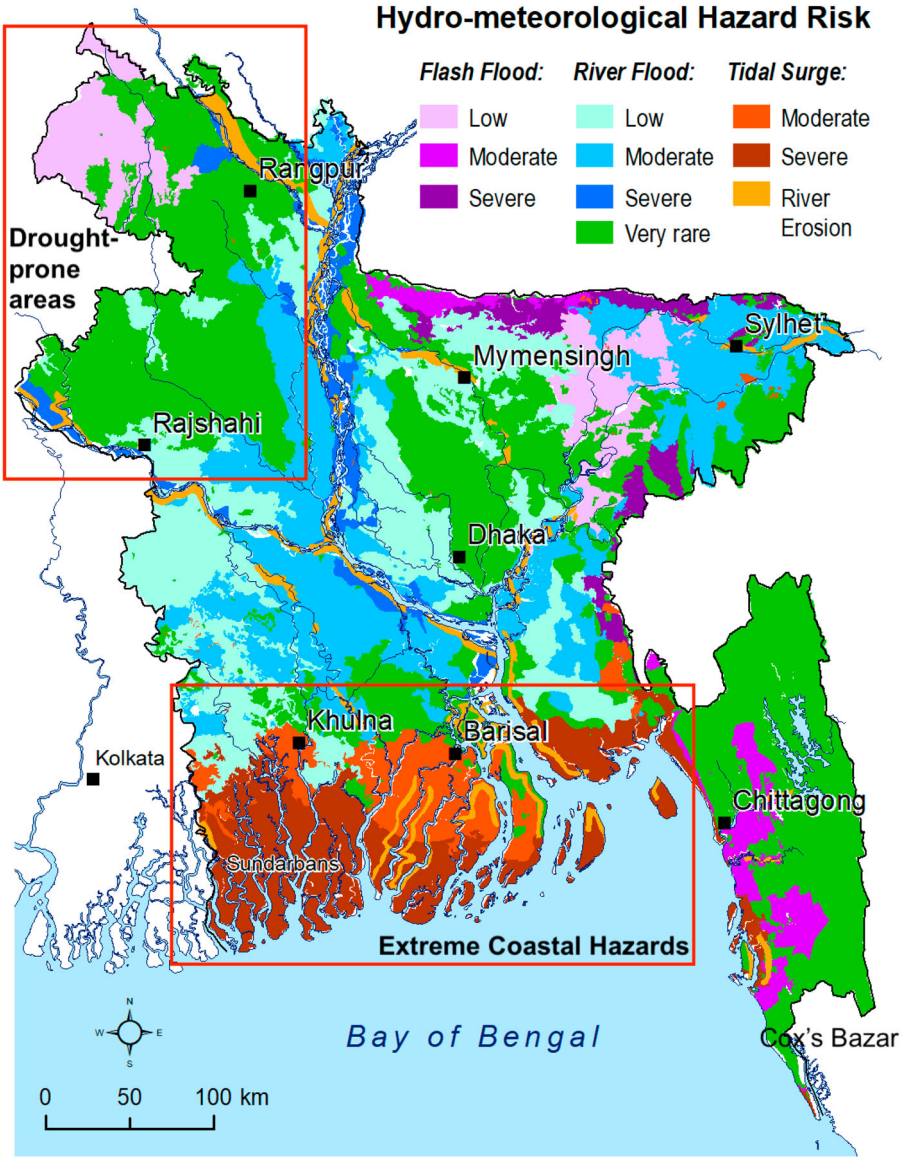

Figure 1. Climate-related multi-hazard risk map of Bangladesh.
Source: Sammonds et al. (2021, 71).

of Bangladesh governmen(GoB) has gradually and systematically invested in the construction of thousands of new cyclone shelters and hundreds of kilometers of polders and embankments to protect the coastal societies. In addition, with support from NGOs, the UN and public agencies, the local people continually work together to implement indigenous tidal river management schemes and nature-based solutions to adapt to the changing climate (Gain et al. 2022). Other initiatives include installing flood-resilient tube wells, raising latrines, providing community awareness

training, improving early warning and evacuation systems, training volunteers, and promoting alternative livelihood opportunities (Sammonds et al. 2021).

Regarding slower onset events, such as drought, water scarcity, riverbank erosion and flooding due to increased rainfall or sea level rise, Bangladesh has been a pioneer in introducing saline-resistant crops, building ponds for fish or irregation, pumping groundwater for agricultural activities, and thus reducing flood risks (Shamsudduha et al. 2022), and introducing floating gardens, schools, and health centers. These efforts have allowed people to adapt to divserse climatic events.

3.2. Climate change and human mobility – a new challenge

Every year, millions of people are displaced because of extreme weather-related disasters in Bangladesh. Only in 2020, over 4.4 million people were displaced due to hydrometeorological disasters (IDMC 2021). Historically, about 10% of the population migrates internally and permanently for various reasons, and many of them migrate from rural areas to large city centers due to weather-related disasters (Sammonds et al. 2021). This type of climate mobility (migration vs non-migration) phenomenon has become a critical and contemporary challenge for Bangladesh.

For example, in the case of cyclone-induced displacement, many of those who end up homeless due to the losses and damages caused by the storms tend to spend a limited amount of time in temporary shelters on the embankments and later return to rebuild their homes with the help of post-disaster relief programs or social networks. Some, however, migrate to nearby cities or to the capital Dhaka and may need help to return to their coastal home areas. In such a context, there are essential differences between those who own land, as they are more likely to be able to return home and live off the ground, and those who are landless (Ayeb-Karlsson 2021). Regarding more slow onset climatic stress, most migration decisions will relate to the increased inability of people to sustain themselves on livelihoods due to climatic changes such as agricultural activities, fishing, or livestock (Ayeb-Karlsson et al. 2016).

For a long time, most of Bangladesh's migration was directed toward the capital Dhaka or other more significant urban migration hubs such as Chittagong or Khulna. However, the new settlers often struggled with their limited options of where to live and work, which may expose them to dangerous living and working conditions. As a result, many migrants end up settling in slums or informal settlements that may be cramped and lack sustainable water and sanitation systems. These living conditions and work-related accidents often come with health consequences that may even leave people in a more fragile financial situation than before the move. Adding to this, people living in informal settlements are often socially stigmatized, and it is reported that they can be exposed to new urban hazards such as violence, crimes, drugs, flooding, or fires (Ayeb-Karlsson 2021; McNamara, Olson, and Rahman 2016). People who migrate and find themselves in these circumstances often want to leave (Speak, 2010). When desiring to leave but being unable to do so and, in this way, self-identifying as 'trapped' or involuntarily immobile, it may impact their wellbeing and mental health (Harasym et al. 2022; Hayward and Ayeb-Karlsson 2021; Kelman et al. 2021). However, within this (im)mobility context, it should also be noted that Bangladesh has a long history of finding innovative ways to cope with climatic change. As a response, the

GoB has invested in and welcomed research-to-action projects focusing on building assisted migration schemes to smaller towns that historically have received fewer migrants (Khan et al. 2021).

3.3. National policies on HM and DR governance

Since its inception in 1972, Bangladesh's Ministry of Disaster Management and Relief (MoDMR) has been pioneering in tackling the impacts of natural hazards. However, the concept of human-induced climate change is relatively new in the global context gaining popularity since the 1980s. Nevertheless, the MoDMR has produced a series of DRR legislative, policy and best practice frameworks, notably, the Standing orders on disasters (1999), the Disaster Management Act (2012), the National Disaster Management Policy (2015), the National Strategy on Internal Displacement Management, and the most recent National Plan for Disaster Management (NPDM) (2021–2025).

The described national climate adaptation profile has placed the country as a leading voice within the Least Developing Country (LDC) group of the UNFCCC climate negotiations both by highlighting the need for global responsibility related to losses and damages and by using their national adaptation planning as case study country examples of what can be done to manage around climate change. The NPDM recognizes that Bangladesh is particularly exposed to climate risks foreseen to generate massive displacements of people in the future. For this reason, under priority 2 (disaster risk governance), it reiterates that local governments should work in tandem with a set of actors, including migrants, and lists, among its key targets, the implementation of the '*National disaster and climate-induced displacement management strategy due to natural disasters*' (Siddiqui, Islam, and Akhter 2015) which focuses specifically on climate-induced internal displacement. However, in the NPDM, no reference is made to the governance of the risks associated with other types of HM, including voluntary mobility and immobility. This happens even though Bangladeshi people are known to have moved internally and internationally for reasons other than climate change, including short-term labor contracts and long-term migration (Siddiqui 2003; Azam 2013).

In addition, some people decide voluntarily to remain in climate risk hotspots due to cultural and social reasons (Mallick & Schanze 2020). Meanwhile, gender roles and norms can determine when and under which conditions women (and men) are allowed to move (e.g. Ayeb-Karlsson 2020). The Bangladesh Climate Change and Gender Action Plan (MoEF 2013) envisages a range of actions to support livelihood for women who have migrated due to climate change. This includes an increased participation of women in efficient water management, as well as better social security and protection of women, adolescents, and children pre-, during and post-disaster and emergencies (10). In addition, it discusses how, due to male migration, women can take on the breadwinner's role in the household and be employed in sectors otherwise inaccessible to them.

In a complex context such as Bangladesh, factors contributing to human mobility and immobility are multiple and often intersecting. Push factors, especially economic motivations, tend to appear more frequently than pull factors (Neelim & Siddiqui 2015; Luetz 2018). Gray and Mueller (2012), among others, have challenged conventional narratives about disaster-induced displacement in Bangladesh, showing that disasters do not always

generate mobility but, in some cases, even decreases mobility due to new labor opportunities in the place of origin, by reducing the resources necessary to migrate, especially for the poorest population groups. Moreover, disaster-induced movement is often short-distance and short-term, and only in some cases, results in long-term cross-border migration. The emphasis on hazard-related HM distracts from understanding of how the local socio-cultural context and adaptation or maladaptation interventions contribute to mobility outcomes. For example, Kabir et al. (2018) noted that, in drought-prone locations in Bangladesh, the overdue microcredit burden greatly influenced the decision to migrate long-term.

Despite that numerous stakeholder mandates are managing HM issues, a comprehensive migration governance framework has been missing in Bangladesh for long. One of the pioneering policy documents was the Bangladesh Climate Change Strategy and Action Plan (BCCSAP). It identified climate-induced displacement as a significant threat to the country's development process. Accordingly, it proposed to develop a mechanism to monitor internal and external migration due to climate change (MoEF 2009). In recent years, the IOM presented the 'Bangladesh Migration Governance Framework' to addresses explicitly the mobility dimensions of crises, thus taking a broader perspective and mentioning the right to protection for disaster-displaced people and crisis-affected persons residing on its territory (e.g. the one million undocumented Rohingya refugees) and, where appropriate, for its nationals abroad.

Moreover, the document takes a vulnerability reduction–driven approach stressing that '*the root causes of crises and associated population movements need to be part of longer-term approaches towards recovery, transition and sustainable development*' (IOM 2020, 11). Additionally, in 2021, the MoDMR prepared the National Strategy on Internal Displacement Management, which details internal displacement guiding principles for preventing displacements, protecting people during displacement, and facilitating durable solutions (MoDMR 2021). These new policies are much needed as efforts to manage the different aspects of migration in Bangladesh sometimes have been reported to be uncoordinated and fragmented across various agencies.

Although each national context displays its dynamics and progresses in the integration of the HM and DR governance realms, the case of Bangladesh exemplifies many of the existing obstacles in its integration, i.e. lack of adequate acknowledgement of the complex interactions between opportunities and motivations to move under the pressure of natural and human-induced hazards.

4. Towards an integrated approach for HM-DR governance

In this paper, we have looked at HM and DR governance systems to illuminate the interdependencies and interlinkages between the two and the common transboundary and cascading effects. Acknowledging these interactions, international policy frameworks have tried to step up to the challenge by moving towards more integrated governance approaches. While signs of progress have indeed been made in the past years, both at the international (see section 2) and national (see section 3 on Bangladesh) levels, it is worth noting that they mainly consist of the integration of concepts and references about one system into the other's policy frameworks. This reflects a rather siloed approach to governance while we need to move towards more integrated and convergent

solutions. Conversely, an integrated governance approach based on systems-thinking should systematically reflect and act upon the areas of intersection between the domains, leveraging the opportunities and countering the vulnerabilities that may arise.

Our analysis identified two main drivers that are holding back its integration. Firstly, forced migration induced by climate extremes often referred to as climate displacement, has dominated the policy discourse around the interaction between HM and DR in international and national frameworks based on the underlying assumption of the existence of a linear relationship between climate change impacts and migration decisions (Kelman 2020; Boas et al. 2022). However, '*relations between climate change and human migration are often indirect, small-scale, and taking shape in context-specific ways, influenced by a host of other socio-economic and political factors*' (Boas et al. 2022, 3365). Furthermore, the focus on so-called 'mass migration' under climate extremes has overshadowed other types of HM (e.g. voluntary mobility and immobility) and the associated positive and negative implications (Kelman 2019; Bettini 2013; Ayeb-Karlsson et al 2022). Secondly, over the past decades, risk management work, responsibilities and roles have been compartmentalised, mainly adopting a *risk layering approach* (Hochrainer-Stigler et al. 2020), which addresses one risk component, and/or one layer, at the time.

An integrated HM-DR governance approach would benefit from incorporating two conceptual frameworks that have emerged in recent years. The interactions between HM and DR domains clearly generate threats that possess the characteristics of systemic risks. Indeed, the movement of people in the context of hazard risks and disasters can produce transboundary, uncertain, non-linear effects with multiple (positive and negative) feedback loops and tipping points (Tagliacozzo et al. 2022). In terms of risk management in a joint HM-DR framework, *a systemic risk perspective* allows us to move toward an approach that maps out existing connections between components within the same system and across different systems to understand the relative contribution of each node to the spread of systemic risks (Hochrainer-Stigler et al. 2020). This approach requires an adaptive, continuous learning style of governance (Renn et al. 2022).

At the same time, a *mobilities perspective* adds complexity to the migration narrative in the context of disasters. It highlights that environmental hazards and risks only sometimes result in migration decisions. Those who stay behind may be vulnerable and willing to remain immobile. Moreover, migration must be seen as a continual process rather than a one-off decision in a person's life course (Kelman 2020; Ayeb-Karlsson 2021).

Existing policy frameworks for HM and DR (e.g. SFDRR) are often deficient in incorporating this complexity and addressing the challenges that emerge from it. There is a need for policy frameworks and processes that propose targeted interventions informed by mapping the areas of interconnection between systems and early identification of the critical nodes that enable the diffusion of the risk at a systemic level. At the same time, it is essential to maintain sight of the positive opportunities generated by (im)mobility in the context of risks, including developing adaptation strategies at individual and collective levels.

As a solution for a more intergrated systems approach, we propose the set-up of an HM-DR Interagency Standing Committee to be established at an international level with national and sub-national focal points that could coordinate the design of common policy frameworks and oversee their implementation. The HM-DR Interagency Standing Committee should develop its interventions along the following lines:

- ***Embracing a human (im)mobilities perspective:*** Common HM-DR governance approaches should consider the entire spectrum of HM outcomes, including voluntary immobility. Interventions should be mindful of (im)mobility experiences and the degree to which they are forced or depend on diverse factors that can vary in time, even for the same individual. HM and DRR policies can determine where a person or a group is positioned across this spectrum and the risks and opportunities associated with occupying that position.
- ***Evaluating HM outcomes considering risks:*** The other aspect that the joint HM-DR Interagency Standing Committee should consider is under which conditions and through which mechanisms HM (in all its spectrum) generates positive and negative risk outcomes. Each HM option should be evaluated in light of the respective risk reduction, risk creation and risk redistribution outcomes for those who move and for sending, transiting and receiving communities and countries. It is essential to consider that the same HM outcome (e.g. deciding not to move) can generate positive and negative risk outcomes simultaneously.
- ***Foster pathways to positive outcomes:*** While HM is often depicted negatively, it represents a critical adaptation strategy to cope with risks. The HM-DR Interagency Standing Committee should work on policy frameworks that recognize, leverage, and potentiate connections fostering risk reduction and adaptation.
- ***Shed light on and counter policies and practices underpinning vulnerability:*** Overall, mapping the interdependences between HM and DR reveals again that attention should be paid to governance mechanisms that make people more vulnerable to a wide net of interrelated risks. Moreover, these risks interact in the real world in a way that their

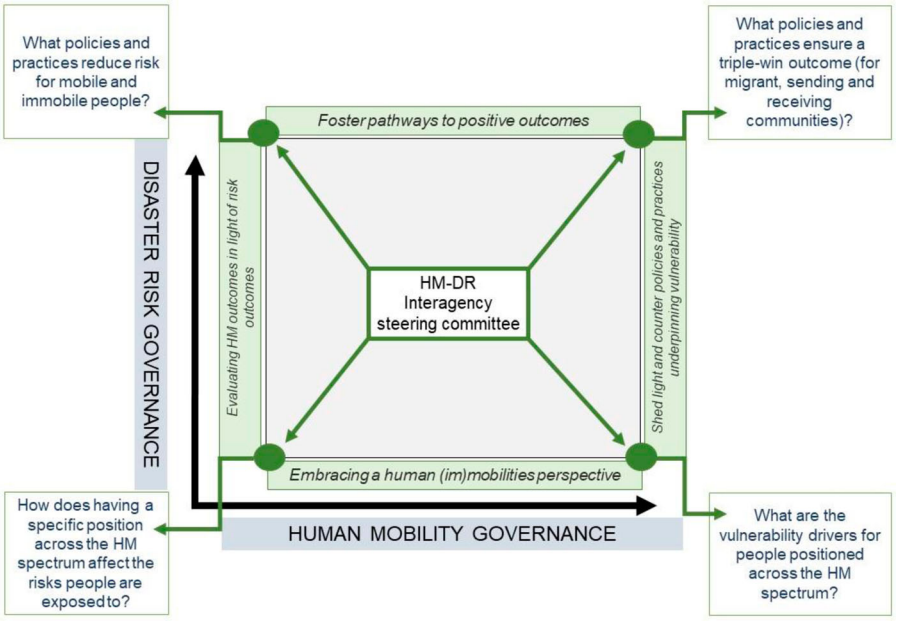

Figure 2. Key areasand questions to be tackled for a more intergrated HM-DR policy approach.
Source: Authors' elaboration.

effects compound one another, enabling, through cascading impacts, the propagation of these vulnerabilities through groups, sectors, and geographies. This could be brought to light, through periodical reports, the underlying drivers of this vulnerability creation at the international and national policy levels.

Figure 2 Summarizes the main areas and questions a more intergrated HM-DR policy approach will need to address.

5. Conclusion

This paper stemmed from the consideration that existing sector-based governance approaches need to be revised in managing risks propagating across sectors, geographies, and systems. There is a need for convergent governance approaches that build on existing sector-specific frameworks and strategies whilst extending their mission to other interacting realms. Given that it is impossible to consider all the global dimensions and issues simultaneously, here we have examined the two domains of HM and DR, which present a breadth of interlinkages (as shown in section 1). After mapping the interdependences between these systems, we have explored to what extent the vulnerability and opportunities arising from these interactions are accounted for and addressed in international policy frameworks dedicated to HM and DR governance. We also examined what happens at a more national level approach by using Bangladesh – one of the most disaster-prone countries in the world – as a case study. The analysis shows that some progress has been made at both levels in integrating aspects related to HM and DR governance. However, respective frameworks still develop in parallel, and points of convergence are not adequately addressed. This can also be attributed to more general trends prominent within these realms. Indeed, dominant narratives place the spotlight, in the DR governance domain, on a single type of hazard at the time (e.g. climate change-induced hazards) and, in the HM governance domain, on one kind of HM outcome (e.g. forced mobility). Thus, in the fourth and final section, we proposed a single governance framework informed by the perspective of systemic risks and human (im)mobilities. This new governance framework will help organize future policy interventions along the four lines described in Figure 2. This is in line with other reports' recommendations that simultaneously address multiple risks (e.g. UNDRR 2022b) and multiple HM dimensions (e.g. IOM 2020). Given that we should avoid the multiplication of agencies on an international and national scale and the duplication of efforts, it is advisable that the new agency partially takes on existing agencies' missions, re-defines existing policy frameworks, and ramps up extant regulations in ways that are more attentive to the cascading and transgressive nature of the HM-DR governance interactions (Renn et al. 2022).

Disclosure statement

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Note

1. Most of the HM references in a UNFCCC context, including those of the TFD, fall under the 2017 five-year rolling work plan of the WIM Executive Committee that relates to the

thematic expert group in the workstream seeking to enhance cooperation and facilitation on 'human mobility, including migration, displacement, and planned relocation' (Ayeb-Karlsson, Baldwin, and Kniveton 2022).

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