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Addressing Climate Change-Related Human Immobilities

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*Addressing Climate Change-Related Human Immobilities**

Jonas Bergmann and Susan F. Martin†

Abstract

A significant share of people in areas strongly affected by climate impacts decide to, or are forced, to stay. Conceptually and empirically, such "immobilities" relate to both structural factors, such as state action and policies, and individual factors, such as people's capabilities and aspirations to move or stay. Robust evidence demonstrates that the climate crisis is increasingly influencing such (im)mobility processes: Climate impacts do not only drive displacement, but they also reduce movement in a significant number of cases. As climate impacts worsen, models suggest that future involuntary entrapment will likely be large both internally and internationally. Simultaneously, studies show that staying in threatened areas can entail multilayered impacts on people's well-being which require dedicated attention by planners and policymakers. Action is needed to respect and support people's right to stay; to guarantee assistance for staying in dignity without immobilizing people; to fulfil the right to leave where desired, without shifting responsibilities to migrants and destination communities; to improve data; and lastly, to support research on the drivers and consequences of immobilities.

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1 Introduction

In 2010, the Conference of the Parties to the UN Framework Convention on Climate Change recognized the importance of climate change-related mobilities in the Cancún Adaptation Framework (UNFCCC 2010; Warner 2012). The framework identified three forms of mobilities: *migration*, which often occurs in anticipation of worsening impacts of slow-onset processes, such as sea level rise, intensifying droughts, or recurrent hazards that reach a tipping point (Zickgraf 2021); *displacement*, which is largely a reactive process that follows extreme weather events, conflict relating to competition over resources, and other acute climate impacts (Black et al. 2013); and *planned relocation* (or *managed retreat*) used to prevent people from becoming displaced from or trapped in places with worsening climatic conditions (Bower & Weerasinghe 2021). Policy attention has increasingly turned to these climate mobilities, although governance remains fragmented and inadequate to address the challenge (Aleinikoff and Martin, 2022; Bergmann et al. forthcoming; Braun, 2023). Beyond the adaptation realm established in the Cancún Framework, mobility has also been considered as driven by, and resulting in, loss and damage under UNFCCC's Warsaw International Mechanism. Similarly, various other international policies processes have integrated the topic, including the Global Compacts for Migration and Refugees and the Sendai Framework for Disaster Risk Reduction. In addition, progressively more regional frameworks exist on the issue.

As important and challenging it is to address these forms of *mobilities* and uphold people's well-being (Martin et al. 2021; Martin & Bergmann 2017), understanding the drivers and impacts of *immobilities* is equally important (Bergmann 2023; Mallick & Hunter 2023). Immobility is the "spatial continuity in an individual's center of gravity over a period of time" (Schewel 2020: 329). *Voluntary immobility*—i.e., people's determination to remain at home despite a worsening environment—affects what types of adaptation, protection, and humanitarian policies are needed and feasible in place (Farbotko et al. 2020; Mallick & Schanze 2020). *Involuntary immobility*—i.e., people's inability to move out of harm's way—may well be the most dangerous outcome for those who need to move because of environmental changes but are too poor, unwell, without social networks to assist them, or bound to their home by obligations (Adams 2016; DeWaard et al. 2022). The seminal Foresight Report warned: "People who are trapped may become more prone to humanitarian emergencies and possibly even displacement if their situation worsens, or if extreme events occur. In such cases, human survival may depend upon unplanned and problematic displacement" (2011: 16).

More than a decade after the Foresight Report, a considerable body of research has emerged on migration, displacement, and planned relocation. Immobilities, both voluntary and involuntary in nature, have been less studied (Zickgraf 2018; Wiegel et al. 2019; Cundill et al. 2021), and the governance of climate immobility remains highly fragmented and nascent at best (Thornton et al. 2023). Immobilities witnessed in recent complex emergencies and during the COVID-19 pandemic underline the need to study and address the agency, needs, and challenges of immobile populations (Martin & Bergmann 2021). This is even more important as models suggest significant increases in future climate-induced involuntary entrapment in dangerous areas (Benveniste et al. 2022). This KNOMAD Policy Report examines the evidence on immobilities related to climatic and other environmental changes and draws conclusions for policymaking, response, data collection, and research.

2 Conceptualizing immobilities

The importance of non-climatic *systemic, structural* factors that facilitate or restrict movement cannot be overstated (Bergmann 2023; Cissé et al. 2022; de Haas 2021). Structural factors that can strongly

constrain mobility include state action and policies, marginalization, power, economic factors, availability of livelihoods, culture, and gender norms. For example, hardening borders and policies to keep people deliberately in place contribute to climate immobilities in many world regions (McLeman 2019). Deterrence policies, such as at the US-Mexican border,[1] as well as confinement policies in camps or urban settings can also trap displaced people during their journeys, as seen in EU-funded Closed Controlled Access Centres (Arar & FitzGerald 2023; Bavo 2018; Mares 2021). Governmental (in)action may also impede mobility even when communities initiate plans to relocate.[2] Moreover, factors in places of origin and destination, interconnections between them, and the costs of moving influence if people can move or stay as well as under which conditions such (im)mobilities occur (DeWaard et al. 2022).

(1) Below the structural level, at the *individual level*, (im)mobility decisions can be conceptualized along two axes: (a) aspirations for and (b) capabilities to move or stay (de Haas 2021). For analytical purposes, four ideal typical outcomes can be distinguished, both for international and internal (im)mobilities (which are both addressed in this report) (Table 1)

Table 1.

(2) When aspirations and capabilities are high and resulting vulnerabilities are low, the result is *voluntary mobility*, such as is often the case for high-wage migration.
(3) When aspirations are high, but capabilities are low and vulnerabilities are high, *involuntary immobility* occurs as people want to move but cannot do so (also discussed as *entrapment*).
(4) When aspirations and capabilities are both low, *acquiescent immobility* ensues, that is, because people do not desire to move, the lack of capabilities is irrelevant to the decision. (Yet, if aspirations to move increase, as may be the case with worsening climate change conditions, immobility could turn increasingly *involuntary*.)
(5) When aspirations are low and capabilities are high, two outcomes are possible. If the capabilities are financial, for example, the decision to remain in place may be *voluntary immobility*. Conversely, if people would have preferred to remain at home but circumstances, such as environmental disasters, require them to relocate regardless of their aspirations, *involuntary mobility* results.

Table 1: Aspirations-capabilities derived individual mobility types (adapted from de Haas 2021: 22)

			Migration capabilities	
			Low →	→ High
Migration aspirations	↓	Low	***Acquiescent immobility***	***Voluntary immobility*** and ***Involuntary mobility***
		High	***Involuntary immobility*** ('trapped')	***Voluntary mobility***

[1] These included the Migrant Protection Protocols, also known as the 'Remain in Mexico' policy, as well as the use of public health laws to prevent asylum-seekers from entering the country.
[2] In the case of Newtok, Alaska, for example, bureaucratic and legal obstacles long delayed implementation of a relocation plan requested by the community in 2008 despite broad agreement on the need to leave (Bronen 2011, State of Alaska 2023), and similar challenges are known from cases in Peru (Bergmann 2021).

Gender influences (im)mobility processes both at the structural and individual level through (dis)advantages linked to norms, values, and laws, as well as different constructions and experiences of reality. For example, in Bangladesh, societal inequalities in an often-patriarchal context shape people's (im)mobility options alongside different male and female subjective attitudes, ideas, and emotions regarding staying or leaving (Tripathy Furlong et al. 2022).

Capabilities to move are not the same as those required to stay (Mallick & Schanze 2020). Staying, for example, may require agricultural skills for climate resilience, while moving may necessitate social and job networks in destinations. Similarly, aspirations to stay and to move are not identical. Furthermore, for immobile populations in threatened areas, it is key but difficult to "distinguish between ability, desire *and need* to move" (Black & Collyer 2014: 52, emphasis added).

Keeping in mind the importance of systemic and structural factors, the aspirations-capabilities lens is useful in determining the extent of coercion that causes or prevents movements. (Im)mobilities are best conceived as located on a continuum between voluntary, acquiescent, and involuntary cases. Still, one must recognize that aspirations and capabilities can be fluid and the four outcomes distinguished above are seldom clear-cut. Immobilities, the focus of this report, are best considered as a continuum from those who are unable to move away from hazards to people who choose not to move (Cissé et al. 2022). Still, improving theoretical models of immobilities will be important for future research (Zickgraf 2021).

3 Climate impacts are already inhibiting movement

Strong evidence shows that the relationship between mobility and climate shocks is moderated by income, and that in a significant number of cases, climate impacts increase international and internal immobility (Beine & Jeusette 2018, 2021; Hoffmann et al. 2020). Given this evidence, the IPCC's latest assessment report highlights involuntary immobility as a representative key climate risk (Pörtner et al. 2022). Especially in high emissions and low development scenarios, the number of involuntarily immobile populations highly exposed to increasing risk will grow, which can exacerbate preexisting vulnerabilities and inequalities.

Regarding internal movements, evidence from 72 countries shows that migration barriers or resource constraints make entrapment more likely for those faced with increased aridity and drought (Hoffmann et al., 2023). As one example, in Malawi, climate damages in human, financial, and social capitals erode capabilities needed for rural-to-urban migration, while especially abrupt shocks can simultaneously decrease aspirations to leave "of even the most dedicated would-be migrant" (Suckall et al. 2017: 298).

Cross-border mobility is especially rare from those countries most vulnerable to the climate crisis (Grecequet et al. 2017), and climate impacts may further decrease such movement. For example, in Burkina Faso and Mali, heat weaves and droughts change agricultural productivity and thereby reduce international mobility (whereas internal short-term and short-distance mobility may increase) (Findley 1994; Henry et al. 2003; Nawrotzki & Bakhtsiyarava 2017). In some communities in Guatemala, rainfall changes exacerbate food insecurity, while simultaneously reducing both options to diversify livelihoods locally and cross-border migration opportunities, making people extremely vulnerable (Milan & Ruano 2014). Hardening borders are one of the factors that hinder people's movements across countries (McLeman 2019).

The speed of hazard onset also shapes immobilities (Koubi et al. 2016; Zickgraf 2021). Often, people decide to stay initially when faced with slow-onset climate impacts such as droughts, though migration may occur eventually. Conversely, displacement is frequently associated with sudden-onset hazards (Black et al. 2013). However, even during sudden-onset disasters, large-scale survey findings from five developing countries show that the less income and education affected people have, the less likely it is that they migrate (Koubi et al. 2022). Additionally, when hazards hit fast and intensely, especially vulnerable households may be unable to evacuate out of harm's way. For example, during a cyclone in Bangladesh, many poor people in an inadequately protected area could only escape to rooftops and higher buildings in the immediate surroundings but were unable to leave their village; their involuntary immobility (or micro-mobility) reflected high vulnerability (Boas et al. 2020). Hurricane Katrina offers an example that such entrapment during fast-onset disasters can also occur in wealthier countries such as the US (Fussell et al. 2014; Fussell 2015).

Besides the speed of onset, the magnitude of climate impacts matters. Movement can be less likely until a certain threshold of impacts is crossed, as observed, for example, for deltaic communities in Ghana affected by sea flooding (Codjoe et al. 2017) and Mexican communities harmed by heat (Nawrotzki et al. 2017). In addition, social and economic thresholds influence the extent of (im)mobilities (McLeman 2011). For example, in some Peruvian highland villages harmed by glacier retreat and rainfall changes, the rate of ongoing climate-related emigration has feedback effects on the (im)mobility of remaining populations: The higher the volume of emigration, the higher the losses of labor force, social capital, and critical infrastructure such as schools, which further increases aspirations to leave (Bergmann 2023).

The extent of future climate-induced involuntary entrapment, especially for the poorest, will likely be significant both internally and internationally. Worldwide, quantitative analyses highlight that climate impacts could reduce cross-border migration of the lowest-income groups by 10–35% in 2100 in different scenarios. As climate impacts reach more severe levels after mid-century, resource constraints limit migration and remittances, and those remittances still received cannot compensate poorer communities in origins for the climatic damages experienced. As a result, those unable to leave likely end up highly vulnerable to climate impacts and poverty (Benveniste et al. 2022). The data on internal migration suggests that reductions in movement may be similarly high in some regions. In South Asia, even optimistic 1.5°C warming above pre-industrial levels by 2050 may reduce household income and thereby decrease the number of households migrating from rural to urban areas by more than a quarter (Choquette-Levy et al. 2021). Thus, the IPCC has medium confidence that scenarios with high emissions and low development "raise the potential for … larger involuntary immobile populations that are highly exposed to climatic risks" (Pörtner et al. 2022: 64).

Not all people who stay in threatened zones are forced to do so; attachments to place, culture, and people can also result in deliberate immobility (Cissé et al. 2022; Mallick & Schanze 2020). First, people may intentionally choose staying over moving when they perceive their livelihood resilience and adaptation options in place to be sufficient to confront future hazards (Mallick et al. 2020). A review of 77 studies in Africa finds, for example, that the ability of affected persons to develop coping strategies with environmental stress was the second most important reason for environmental non-migration (Balgah & Kimengsi 2022). Similarly, in the highly vulnerable coastal Indian Sundarbans, strategies contributing to social and livelihood resilience increase people's capability and aspiration for voluntary immobility (Sengupta & Samanta 2022). Deciding to stay is also possible when affected people perceive moving as potentially raising vulnerabilities (Farbotko et al. 2020). Such decisions to stay put can express people's agency and valid assessments or sense-making of environmental risk based on profound knowledge of their life circumstances, which may diverge from the views of

authorities, as seen in the case of a Chilean community refusing to be relocated (Wiegel et. al. 2021). Still, subjective perceptions may also fail to match reality due to a lack of information or cognitive biases (Czaika & Reinprecht 2022). For example, a study in Burkina Faso finds that biases and a lack of access to information affect people's climate change perceptions and thus also shape their household decisions if to move or stay (Longueville et al. 2020). Lastly, certain attitudes towards risk as well as culturally engrained attitudes and norms can also favor voluntary immobility (Cattaneo et al. 2019). Survey data from 30 transition countries, such as Egypt, Mongolia, and Morocco, shows that risk aversion strongly reduces willingness to migrate abroad and internally (though less so in riskier sending areas) (Huber & Klaus 2020).

Additionally, people who are satisfied with their places of residence often choose to stay notwithstanding rising climate risks, at least initially. This dynamic is observed, for example, in highland villages in the Andes; despite increasing hazards, affected people reported that they experienced this type of grounding place satisfaction for reasons including spiritual or recreational benefits of their surroundings, such as those derived from sacred glaciers (Adams 2016). Generally speaking, populations that are deeply socially and culturally rooted are more likely to choose to stay (Findlay & Geddes 2011). In particular, Indigenous people and islanders tend to have strong cultural and spiritual links to place that can render leaving an undesired option (Piggott-McKellar & McMichael 2021; Yee et al. 2022a). For example, in Fiji and the Maldives, commitments to land, culture, identity, and family favor voluntary immobility (Kelman et al. 2019; Yee et al. 2022b). Many islanders in Tuvalu also actively resist relocation and voluntarily choose immobility for cultural and spiritual reasons, although they face severe climate risks (Farbotko et al. 2016; Farbotko & McMichael 2019). Although long-term habitability is threatened in this island country, people also seem to choose immobility as a conscious attempt to express their concerns about climate impacts. They hope to raise ambitions to reduce emissions—which could decrease climate impacts and needs to move—and to generate funding for local adaptation as well as compensation for Loss and Damage (L&D) (Beine et al. 2019; Noy 2017). Even during sudden-onset disasters, the strength of connections to home and local networks influence immobility. For example, people who explicitly decided against evacuation during Hurricane Katrina in the US often either had strong local ties – or were socially isolated (Thiede & Brown 2013). Moreover, cultural, folkloric, and religious convictions, social hierarchies, as well as inadequate information systems can lead to voluntary immobility despite sufficiently early warnings of approaching hazards (Ayeb-Karlsson et al. 2019).

Finally, people's different life course stages affect (im)mobility decisions. Older people tend to be more likely to decide to stay because they are often more culturally, socially, and psychologically rooted, less physically mobile, and the less expected lifetime an individual has, the lower the lifetime returns of a possible move may seem (Zaiceva 2014). For example, studies find that among people affected by hazards in Malawi and Morocco, those who moved, or aspired to do so, were mostly younger age groups, while certain older respondents appeared more settled and planned to stay (Suckall et al. 2017; van Praag 2021). Yet, a share of the older adults also lacked resources to start a new and thus were involuntarily immobile.

4 The impacts of immobility are multi-faceted

Generalizations about the impacts of immobilities are difficult because a range of reasons influences why—and under which circumstances—people opt to stay.

Prevailing structural conditions in affected areas do not only strongly influence if people can move at all. They are also a key determinant of the well-being outcomes of immobilities (Bergmann 2023; Cissé et al. 2022). For the many people affected by severe climate impacts who remain in regions with

adverse structures—such as weak governance, widespread marginalization, land and tenure issues, high inequalities, and development gaps—immobility is bound to threaten well-being. Additionally, the impacts for stayers also depend on temporal dynamics. In some cases, the more advanced the volume of emigration from a given location, the more negative can the impacts for stayers become, such as those related to losses of labor force, community structures, and social capital as well as closure of schools and medical posts (Bergmann 2023).

Well-being risks seem especially high for involuntary immobile, non-resilient populations who cannot leave areas severely affected by climate impacts and experience cumulative damages (Mallick & Schanze 2020). The IPCC notes high agreement "that immobile populations often have high vulnerability and/or high long-term exposure to climate hazards" (Cissé et al. 2022: 1177). As one example, during droughts in Kenya, the poorest often ended trapped and suffered most from food insecurity (Herren 1991). Health challenges related to entrapment can be grave (Harasym et al. 2022; Schwerdtle et al. 2017). Cases in Alaska and in Peru demonstrate, for example, that climate change can increase infectious diseases, food insecurity, injuries, and mental health challenges for immobilized groups (Bergmann 2021; Brubaker et al. 2011). Entrapment in dangerous areas can also worsen people's adaptive capacities and well-being, including through continued hazard exposure and resultant downward spirals of loss and damage, further reductions of migration capabilities, and declines of subjective well-being (Bergmann 2023). Similarly, in Bangladesh, environmental migrants trapped in destinations suffered from severe non-economic losses and mental health challenges (Ayeb-Karlsson et al. 2020). Environmental migrants trapped in unwelcoming surroundings may also face hostility, racism, and violence (Sow et al. 2016).

While voluntary immobility in risk zones can initially yield better results than entrapment (Ahsan et al. 2022), with increasing climate impacts and emigration, "conditions can gradually worsen and threaten stayers' adaptive capacities and well-being" (Bergmann 2023: 267). The IPCC also warns that people who are voluntarily immobile today may enter a downward spiral of poverty with rising climate impacts, making them unable to move later although they then may wish to do so (Cissé et al. 2022). In addition, voluntary immobility may also pose risks to first responders who must rescue those who should have evacuated. Finally, it may entail environmental harms when people refuse to leave fragile areas.

Still, the evidence on the complex well-being effects of immobilities in climate-affected areas remains limited. Policymakers and practitioners need to know more about how staying affects people's well-being overall. Particularly key is a better understanding of how impacts evolve over time, as hazards and emigration volumes change, in order to identify critical entry points for targeting policies and interventions to safeguard people's well-being. Researchers should pay attention to how different degrees of voluntariness of immobilities, different structural conditions such as state action and policies, and different degrees of agency influence well-being outcomes. Beyond important standard measures of well-being, such as regarding livelihoods, health, safety, or infrastructure, integrating metrics on people's *subjective* well-being (SWB) will be key in such assessments (Bergmann 2023; Tschakert et al. 2017; Tschakert et al. 2019). SWB metrics measure life satisfaction and emotional balance. It is increasingly recognized in migration and sustainability studies as well as other fields that such SWB indicators provide crucial complementary information on people's lived experiences that are necessary for devising adequate policies (Lutz et al. 2021; Diener and Tay 2016; OECD 2013; Hendriks and Bartram 2019).

5 Recommendations for policy, response, data, and research

Although attention has increased, immobilities remain "a neglected challenge" in policy, research, data, and modeling (Cundill et al. 2021; Geddes et al. 2012: 953; Zickgraf 2018). Policy inattention and a lack of data lead to a fragmented governance approach and with little to no dedicated policy tools for climate immobilities. Only few policy hints exist in disaster risk reduction or climate mobility frameworks, and while human rights frameworks are applicable to all (im)mobile populations in theory, their implementation remains insufficient to provide effective protection in many cases (Thornton et al. 2023).

Policymakers and planners must recognize that immobility, like mobility, has multiple drivers and varied effects that pose governance challenges at multiple levels (Black et al. 2013). Especially people trapped in the face of the climate crisis may be as or even more vulnerable than those who are forcibly displaced. People involuntarily trapped above all require options to leave dangerous zones in dignity and build a decent life afterwards. As long as they cannot leave, they require protection from well-being threats and action to address climate exposure and vulnerability. Conversely, voluntary immobility requires continuous action to build local resilience and sustain livelihoods in the threatened zones where people opt to stay. This includes their human security, social protection, health, and the provision of services. Improving rural-urban linkages, for example through remittances, could also be beneficial in some cases. To address these significant challenges related to different forms of immobilities, both adequate policies and sufficient resources for implementation are needed (Geddes et al. 2012). Existing commitments mean that the international community has not only a responsibility to remedy harm and provide support for displaced persons but also for those staying in increasingly dangerous areas (Aleinikoff & Martin 2022). However, this responsibility has not been adequately fulfilled yet. Additional governance challenges can arise when states perceive required international assistance as infringing on their sovereignty. (Black et al. 2013; Ferris & Bergmann 2017).

5.1 Respecting the right to stay

Although many climate impacts are already locked-in through past emissions, the IPCC cautions governments against swiftly declaring people "as being 'trapped' or to actively promote relocations in the absence of local agreement that in situ adaptation options have been exhausted" (Cissé et al. 2022: 1177). People must not be relocated against their will but be supported within the realm of possibility—a principle enshrined both in the UN Declaration on the Rights of Indigenous Peoples and in human rights frameworks, which include the right to self-determination (Farbotko et al. 2020). One should not "minim[ize] the significance of the 'right to stay' in places that are vulnerable to environmental extremes" (Black et al. 2013).

For people who decide voluntarily to stay in their homelands even despite increasing uninhabitability, "ethically robust and culturally appropriate policies and practices" are required (Farbotko & McMichael 2019: 148). Preserving their well-being to the extent possible must be a priority. Consultation, participation, and respect for human rights should be key principles for such endeavors, and climate financing combined with compensation for loss and damage are needed (Thornton et al. 2023). Compensating unavoidable loss and damage will indeed be critical for all (im)mobilities, as states increasingly note in their adaptation strategies (Bergmann et al. forthcoming; Hirsch 2021; Ryder 2021). The new Loss and Damage Fund, to be negotiated under the UNFCCC, will be important in this respect (Lo 2022; UNFCCC 2022a, 2022b).

5.2 Financing local DRR/DRM and adaptation in dignity without immobilizing people

For affected communities who wish to remain, living with, and adapting to hazards may be a more suitable solution than moving in some cases (Black et al. 2013). Disaster risk reduction and management frameworks as well as human rights norms provide key entry points. Measures to improve local adaptation and to reduce vulnerability are especially needed where places have characteristics that may trap populations (Nawrotzki & DeWaard 2018) or where people knowingly choose to persist in life-threatening situations (Farbotko et al. 2020). The IPCC observes that "build[ing] adaptive capacity, including meeting the SDGs, reduce[s] future risks of climate related involuntary … immobility (medium confidence)" (Pörtner et al. 2022: 96). Support in place should include awareness-raising of risks and education, appropriate financial resources, livelihood diversification options, skills training, as well as improved monitoring systems for hazards, diseases, food, and water security (Afifi et al. 2016; Brubaker et al. 2011). As for displaced populations, approaches that integrate Humanitarian-Development-Peace dimensions are needed (Bergmann et al. forthcoming). Still, care is needed that adaptation and resilience practice do not impel involuntary immobility by "implicitly obliging … citizens to hold fast and dig in, shore up defences and hope for the best" (Baldacchino 2018: 223).

5.3 Fulfilling the right to leave where desired, without shifting responsibilities

In other cases, moving is the best among many challenging options to reduce humanitarian catastrophes for immobile populations (Nabong & Opdyke 2023; Nawrotzki & DeWaard 2018). Many people who desire to stay for socio-cultural reasons reckon that climate impacts can overwhelm their capacities, and express the need to move, as witnessed in Senegal and Vietnam (Zickgraf 2019).

Therefore, support for involuntarily immobile groups should include the right to move (Black et al. 2013: S39), so people can reduce vulnerability, diversify livelihoods, and support others who stay through remittances (Geddes et al. 2012). Such a right to move must not outsource the responsibility to adapt to climate impacts to individuals (Felli & Castree 2012) or ignore salient questions of power and race (Baldwin 2016). Still, "policies to restrict migration rarely succeed, are often self-defeating, and increase costs to migrants, communities of origin, and destination communities" (Webber & Barnett 2010: 30). The IPCC (2022) finds that the cost of climate change can be lowered significantly if policymakers create conditions in which migration can serve as a positive adaptation option. Beneficial support can include microcredits, loans, and safety nets (Afifi et al. 2016), boosting access to social networks for migrants (Nawrotzki & DeWaard 2018), and job creation in destination areas (Foresight 2011). For all forms of immobility, translocal approaches that integrate communities in source and destination areas are required: projects should expand the adaptation potential of financial and social remittances sent by individuals and hometown associations and improve translocal communication possibilities (Bergmann 2023). Money may also facilitate movement: small cash transfers, paired with risk transfer mechanisms, can significantly facilitate migration as an adaptation response, improve incomes, and reduce inequality (Choquette-Levy et al. 2021).

Additionally, more accessible legal pathways for affected people and logistical support are needed so they can leave dangerous areas (Bergmann et al. forthcoming; Braun 2023; Pörtner et al. 2022). First, states should use existing legal and policy entry points to grant entry and stay of trapped persons more thoroughly and effectively. Regional refugee approaches with more generous eligibility criteria, such as in Latin America and Africa, could provide a role model for other regions. They must be adequately funded and implemented, with substantial support by the international community. In addition, UNHCR should receive a wider role in supporting states to take a more expansive approach in determining refugee status and help them interpret and apply existing norms (Goodwin-Gill & McAdam 2017).

Second, policymakers should further expand regional or national protection mechanisms based on humanitarian and climatic grounds. States could devise a Nansen passport for people trapped in areas increasingly uninhabitable due to climate impacts (e.g. certain SIDS) (WBGU 2018) as well as new climate-humanitarian visa with pathways to permanent residency and citizenship. From a justice perspective, such mechanisms are urgently needed to address the loss and damage caused by climate change. Furthermore, humanitarian admission programs such as Temporary Protection or Stay Arrangements (TPSAs) can help to ensure admission and stay for some time in case of disasters. States should also apply and expand Temporary Protection Directives or guidelines to open legal pathways for moving. Other temporary or subsidiary mechanisms such as resettlement, family reunification, and community sponsorship programs should also be expanded and expedited. Protection standards should be raised in these instruments and they should include a route to long-term residence (Frelick 2020; Bergeron 2014; Cantor 2015; McAdam 2011; Braun 2023).

Third, regular migration pathways are another possibility for trapped people needing to enter and stay in other countries that should be expanded. Such pathways can include bilateral or regional labor migration agreements, free movement protocols, trade agreements, visa lotteries, skills partnerships, and temporary or permanent visa schemes (Dempster et al. 2021; Geddes et al. 2012; Wood 2022). For example, relevant free movement agreements exist in various African regions and in Latin America. These binding mechanisms with relatively broad eligibility criteria should be more fully implemented so as to safeguard assistance for humanitarian needs, provide chances for long-term recovery, and enable circular movements of climate-affected persons. High-income countries must refrain from pressuring regions such as ECOWAS to keep people far from their borders and thereby undermine regional free movement agreements (Castillejo 2019).

Managed retreat or planned relocation from severely affected areas hold certain potential as last resort measures for improving human security (Ferris & Weerasinghe 2020). However, caution is needed since previous projects have often harmed affected people and served political and economic motives, including control over populations (Ajibade 2019; Bergmann et al. 2021; Farbotko et al. 2020; Hino et al. 2017; Wilmsen & Webber 2015). The IPCC notes high agreement that many past examples have been expensive, contentious, challenging, distressing, and disruptive (Pörtner et al. 2022: 92). Where permanent retreat becomes unavoidable, strong policies and sustained support are needed to safeguard people's well-being prospects (Bower & Weerasinghe 2021). Useful guidelines and best practices in this area have been published by key actors in the field and should help inform national legislation and operations (refer to Brookings et al. 2015; UNHCR et al. 2017).

5.4 Improving data

Concerned actors must enable all people in affected areas to access evidence about climate hazards and their cumulative effects in their homes, so they can make informed decisions about whether to invest in place or prepare moving to suitable destinations (Bergmann 2023). Better and more readily available data is key to this end. Information campaigns and pre-departure orientation workshops could help people make informed decisions (Clement et al. 2021).

In addition, data on immobile populations remains an important gap that future data collections should reduce (Carling & Schewel 2018; Schewel 2020; Vinke & Hoffmann 2020). Combining big data analyses with qualitative research (Boas et al. 2020) and integrating new study methodologies, such as life history interviews, could provide ways forward (Singh et al. 2019).

Distinguishing between voluntary, acquiescent, and involuntary immobility is difficult conceptually and operationally (Black et al. 2013; Mallick & Schanze 2020). Data often shows that disasters "displace" far fewer people than they "affect" people who remain at home, yet these data do not allow for an

identification of who stayed voluntarily and who was trapped, and how that influences vulnerabilities. Future data collection should learn from recent advances in identifying (DeWaard et al. 2022) and modeling trapped populations (Benveniste et al. 2022).

5.5 Supporting research

Immobilities require more in-depth research with better conceptual frameworks, methodological innovations, and comparative approaches (Mallick & Schanze 2020: Hoffmann et al. 2020; Schewel 2020). Donors should fund research to:

- identify and analyze the drivers of climate immobilities and extend recent efforts to identify, study, and model trapped populations;
- evaluate how (in)voluntariness in climate immobilities can shift over time and how it differs within households and communities;
- examine both objective and subjective well-being impacts of immobilities over time; clarify non-economic losses; and identify drivers of differentiated well-being outcomes;
- identify and promote best practices in enabling immobile persons to live in safety and dignity in their home communities to the extent possible;
- assess gaps and opportunities to finance programs designed to help people adapt in place, and improve evaluations of such programs;
- identify and assess safe and orderly pathways to migration for climate-affected people who may otherwise remain trapped or be forced to use more dangerous modes of movement;
- and monitor and evaluate managed retreat or planned relocation programs to determine if they provide effective alternatives for potentially trapped people.

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