







OVERVIEW

Staying put in an era of climate change: The geographies, legalities, and public health implications of immobility

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Abstract

In response to the proliferation of “climate migration” discourses, researchers are exploring how climate related hazards affect immobile populations. This paper contributes to the conceptualization of “environmental immobility.” Researchers from geography, public health, psychology, and law explore the climate change immobility nexus via three themes: (1) risk; (2) (mal)adaptation; and (3) resilience, protection, and vulnerability. The aim of this paper is to identify and discuss the key concepts and rationale for scholars and policymakers who consider both “voluntary” and “involuntary” immobility when researching and responding to the effects of climate change on human movement. The need is critical, as immobility is often underacknowledged as a desirable, pro-active, and practical response to environmental change, preventing large populations from being considered and included in policy, consultation, and support processes.

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Vulnerability and Adaptation to Climate Change > Values-Based Approach to Vulnerability and Adaptation

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1 | INTRODUCTION

The evidence on whether climate change leads to increased migration is contested and incomplete within contemporary research on environmental migration (Black et al., 2011; Kelman et al., 2019; Nawrotzki & Bakhtsiyarava, 2017; Perch-Nielsen et al., 2008). The links between environmental stress and mobility are not deterministic and are complex to examine. Both migration and non-migration decisions are often the result of multiple mutually influencing drivers (Black et al., 2011). Given these complex interactions of legal, political, structural, systemic, cultural, financial, and psychological factors, the study of climate change and migration requires an interdisciplinary approach. As Wallace (2023) notes, research intended to understand the ways it impacts multiple interests “cannot be limited to any one discipline” (p. 12). Collaborations among disciplines with epistemological distance (e.g., those that rely more on quantitative methods working with those that rely more on qualitative methods), are more likely to achieve new insights on complex problems (Choi & Pak, 2008). Experiences of and responses to climate link with social inequalities, with some populations experiencing more adverse effects than others (e.g., women, children, elderly, those with disabilities). These disparities also require a broadened understanding generated by interdisciplinary approaches (Pearson et al., 2023).

Scholarly emphasis has been on examining the causes of migration until relatively recently, when researchers turned their attention to how these same causes can contribute to immobility (Zickgraf, 2018). To increase understanding about the links between climate change and those who stay in place, for whatever reason, this paper will provide an interdisciplinary perspective on the geographic, social, legal, psychosocial, and public health impacts of immobility and climate change. The result of a collaboration between human and environmental geographers, psychologists, public health and legal scholars, this discussion will highlight synergies between these disciplines and suggest ways they can collaborate in the future.

While we acknowledge the links between sudden onset environmental events and immobility (Gray et al., 2012), we will focus on “slow onset hazards” (Mallick et al., 2021) with examples drawn from empirical research on sea level rise and climate change. Hazards related to the threat of sea level rise are considered the most common environmental pressures to migrate linked to climate change and raise important questions for communities and policymakers around adaptation, resilience, and vulnerability. Moreover, there are strong links between a slow increase in sea level and increased risk of rapid onset events such as flooding and storm surges, as “risk associated with changing sea level also is related to individual events that have a limited duration, superimposed on the background of these gradual changes” (IPCC, 2019, p. 4). Thus, storm surges and flooding will have greater impacts when they occur on a higher baseline of sea level. Similarly, other environmental systems such as drylands face combinations of hazards arising from climate impacts—in this case slow onset droughts that have implications for rapid onset fires. Altogether, we argue that the conceptual exploration in this article is relevant to all types of environmental pressures.

The latest Intergovernmental Panel on Climate Change (IPCC) Assessment report (IPCC, 2021) states it is virtually certain that global sea levels will continue to rise this century, with a wide range of scenarios projecting rises of 0.28–0.55 m under a low emission scenario, to 0.98–1.88 m under a high emission scenario. Given the population density of coastal regions, this has significant implications for (im)mobility: 190 million people currently inhabit land that is projected to be below the high tide mark in 2100 under a low emission scenario, rising to 630 million people under a high emission scenario (Kulp & Strauss, 2019).

Yet, as scholars have long recognized, even in the most extreme circumstances most will remain immobile (Bell & Charles-Edwards, 2013; Edmond, 2020; Gray, 2016). While it is true that the projected high-end sea level rise would likely cause widespread displacement, this should not be understood as referring only to internal or international migration be it “voluntary” or “involuntary”¹ (Lubkemann, 2008). As Lubkemann demonstrates, those who suffer the most displacement (i.e., to their personal safety and livelihoods) are precisely those who are the most immobile. Writing in the context of wartime migration, he points to a “theoretical invisibility” within the forced migration literature, arguing that the “the forms of disruption and disempowerment we reflexively tend to attribute to wartime movement ... [are] in fact far more often the product of involuntary immobilization than of migration per se” (2008, p. 455).

When there is environmental pressure to move, some people are mobile and then immobile, for example, remaining in migrant camps voluntarily or involuntarily (Ayeb-Karlsson et al., 2020). Yet, most never leave to begin with (Zickgraf, 2018). There are myriad reasons (economic, psychosocial, political, and cultural) why the overwhelming preference will be for immobility in even the most extreme circumstances. From a “top-down” perspective, governments will be motivated to protect coastal regions with high economic or strategic value thus preferring immobility. An example is the Dutch effort to “climate proof” the Netherlands via large scale flood defenses (Niemeyer et al., 2016). From a “bottom-up” perspective, as Perch-Nielsen et al. (2008) point out, non-economic considerations about whether to

“protect or abandon ... the ‘(emotional) attachment to place’ ... might push the decision towards protection.” (p. 388). Within Bangladeshi riverbank communities, place attachment in the form of “rootedness,” based on long histories within a community, increases both a household’s tolerance level for environmental risk and sensitivity to environmental stress (Best et al., 2022). More recently in the Dutch case, Hölscher et al. have sought to transcend the dichotomy between “top down” and “bottom up” by creating a framework for action that incorporates “polycentric, hybrid and experimental approaches that include multi-scale, cross-sectoral and public-private collaborations,” emphasizing the role of both local government and stakeholders (Hölscher et al., 2019, p. 802).

While writing for a wide interdisciplinary audience and using global examples, the authors have a special interest in appealing to policy makers in the Global North for several reasons. First, the prospect of Global North citizens facing climate related pressure to migrate is often underacknowledged in public discourse and media (Sakellari, 2022). Second, the article makes the case that Global North policy makers can learn from their Global South counterparts. Third, much of Global North media and gray literature’s attention has historically revolved around the trope of “millions” of migrants making their way from the Global South into the Global North because of climate change. By further developing the conceptualization and operationalization of immobility within the context of climate change and climate linked pressures to migrate, this article contributes to the literature that aims to nuance or even debunk this trope.

The following sections consider immobility in the context of climate change and climate linked pressures to migrate. Section 2 explores different ways of conceptualizing immobility. Increased understanding about those who will not or cannot move despite environmental pressures requires interdisciplinary exploration that can inform policy and guide aid agencies and other NGOs supporting such populations. Section 3 presents perspectives from geographers, public health experts and legal scholars on three core themes: (i) risk; (ii) (mal)adaptation; and (iii) resilience, protection and vulnerability. Immobility is considered as: an adaptive response (Hjålm, 2014; Mallick, 2019; Zickgraf, 2018), an expression of resilience (Farbotko & McMichael, 2019), “trapped” (Nawrotzki & DeWaard, 2018), “displacement” (Lubkemann, 2008) or indeed a combination of these. The section concludes with an exploration of interdisciplinary approaches to immobility and climate change, which is framed as a Wicked Problem (Rittel & Webber, 1973).

Section 4 concludes the discussion by considering the geographies and the social, legal, and psychosocial impacts of slow onset climate hazards linked to (im)mobility. It argues that a consideration of the causes and experiences of immobility forces a reconceptualization of risk, (mal)adaptation, and resilience, protection, and vulnerability. Finally, it explores policy implications and proposes avenues for future research.

2 | IMMOBILITY AND ITS PLACE WITHIN (ENVIRONMENTAL) MIGRATION STUDIES

Scholars have begun to focus on immobility within the wider context of migration studies as a reaction to a perceived “mobility bias” (Robins, 2022a, 2022b; Schewel, 2019; Schewel & Fransen, 2022; Zickgraf, 2018) that can underpin the “alarmist” narrative of mass migration as an inevitable outcome of environmental change (Wiegel et al., 2019). This bias often influences the perspectives and priorities of policy makers, aid agencies and other institutional actors who have an interest in migration’s causes and effects. Similarly, the public conversation on environmental issues now often focuses on migration (Sakellari, 2022). But, as Zickgraf suggests, “this has perhaps had the unintended consequence of minimizing the risks facing immobile populations ...” by implying that not migrating is unproblematic (2018, pp. 79–80). Farbotko and McMichael (2019) have also declared that “those who choose to remain are deemed unproblematic and unworthy of academic and policy attention” (p. 149). This assumption extends to those who remain involuntarily (Lubkemann, 2008). Unfortunately, immobility is frequently unacknowledged by aid agencies and policy makers who often prioritize those who have managed to migrate. The concept of “displacement,” then, is usually interpreted literally to refer to migrants and refugees even though the most displaced are often those who remain immobile. Further, legal and aid attention on those who are “forced” to migrate is often at the cost of neglecting these “trapped populations” (Black & Collyer, 2014) and those who remain immobile for other reasons (Mallick & Schanze, 2020).

Yet, when academic and policy attention does focus on “trapped populations” it is often within a discourse of “a crisis of immobility” (Aye Karlsson et al. 2022, p. 2). Consideration of how and when to apply terms such as “involuntary” and “voluntary” to immobility requires careful attention when used in (im)mobility studies, especially since real world cases rarely fit entirely into either category (Erdal & Oeppen, 2018). As Erdal and Oeppen (2018) point out, the use of such terms can have far reaching “discursive and analytical significance” (p. 981). Lubkemann (2008) reminds us

that “involuntary” or “forced” migration as an analytical category is itself problematized by the existence of trapped populations.

The often-problematic tendency to dichotomize (im)mobility decision-making as either voluntary or involuntary is also an issue within law. With respect to mobility, existing legal approaches draw a strict distinction between those who are perceived as choosing to move and those who are forced to do so. This is despite there being no agreed criteria delineating the two (Cohen & Bradley, 2010, p. 127), or any clear indication of when the former may transform into the latter.

This is not to say that those who remain in place are neglected by the law—international human rights law, for example, applies to all at all times. Moreover, remaining in situ is a recognized adaptation strategy in the legal literature (McAdam et al., 2016, pp. 24–26). However, a greater focus on those who do move at the expense of those who do not can fail to appreciate that those who remain often acutely feel the consequences of the same cause—such as environmental events—as much as those who flee (IDMC, 2022, p. 78). A greater focus on those who move also fails to recognize that those who remain are often the most vulnerable, and that their immobility may indeed be a manifestation of that vulnerability.

While it may or may not indicate vulnerability, Mallick et al. (2021) note that immobility as a specific adaptive response to environmental change has been insufficiently researched. The discourse on migration as adaptation to climate change risks presents voluntary migration as “a strategic decision that reduces climate change risks within a geographic area” (p. 1). But, given that only a minority opt for this strategy, it is critical to reflect on how staying put can be an adaptive strategy beyond being simply “left behind” (Zickgraf, 2018). Consequently, scholars have become increasingly concerned with understanding immobility on its own terms: as a phenomenon with distinct forms, drivers and impacts, just as has been done with mobility (Mallick et al., 2021; Robins, 2022a, 2022b; Schewel, 2019; Schewel & Fransen, 2022). These reasons for immobility have been framed as forms of both resistance (Halfacree, 2018) and acquiescence (Schewel, 2020), as “livelihood resilience” (Mallick, 2019), or as expressions of a sense of duty (Robins, 2022a), of belonging (Robins, 2022b), and of place attachment (Adams, 2016; Mallick et al., 2021). Place attachment can have economic, psychosocial and cultural dimensions and is often the dominant motivation for staying in the face of environmental pressure to move (Farbotko & McMichael, 2019; Mallick et al., 2021; Perch-Nielsen et al., 2008; Zickgraf et al., 2016). Based on intersections of age, gender, relationship status and other factors, priorities regarding immobility vary widely across populations (Takahashi et al., 2021), adding further complexity to how individuals and collectives can form attachments to place. Moreover, the relations between place attachment, place satisfaction, place utility, rootedness and mobility are ambiguous or at least bi-directional (Best et al., 2022).

The UK Government’s Foresight Migration and Global Environmental Change (MGEC) report (Foresight, 2011) was the first to identify people unable to escape environmentally risky and vulnerable locations as “trapped” populations. However, “trapped” fails to consider a person’s “right to stay” in a place that others may consider as high-risk (Ayeb-Karlsson et al., 2020). It also equates adaptation and resilience with mobility, rendering those who choose to be immobile, or are immobile after initial mobility, as requiring adaptation and resilience interventions (Ayeb-Karlsson et al., 2018). This binary locates “the problem” in human populations affected by climate change, placing them in a remain or leave double-bind with either decision resulting in being considered as a problem—or even a “patient” if their decision is medicalized—rather than as survivors who need to be supported to minimize distress and enhance strengths and coping strategies (Pearson et al., 2023).

Having set up immobility as an object of research within the broader context of interdisciplinary migration studies, we will now explore how varied definitions and understandings of key concepts in migration studies influence how researchers, aid workers, and policymakers approach the relationship between immobility and climate change.

3 | CLIMATE CHANGE AND IMMOBILITY: RISK, (MAL)ADAPTATION, AND RESILIENCE, PROTECTION AND VULNERABILITY

The terms “climate migrants” and “climate refugees” have been appearing more frequently on research agendas as well as in media and society in the last 20 years (Sakellari, 2022). Responding to recent calls to include immobility on the “climate migration” agenda (Zickgraf, 2018), in this section we explore the links between slow onset climate change hazards and immobility via three themes: risk, (mal)adaptation, and resilience and protection.

3.1 | Immobility and risk

Within Western discourses, the use of the word “risk” has increased in both scholarly publications and newspaper headlines since 1945, a trend that has been accelerating since 1997 (Zinn, 2010). Beck (1992) has argued that Western society has become a “risk society” in which governance is increasingly focused on the discussion, prevention, and management of risks that the West have produced. As policymakers have embraced the role of risk assessments, they have often prioritized Environmental risk assessment—with its presumed scientific objectivity—while neglecting the cultural, political, and psychosocial factors that dominate broader human assessment of risk (Hulme, 2009).

Preceding the risk paradigm in the 20th century, approaches to coastal governance in developed areas such as Northwest Europe focused on control of hazards such as flooding and erosion. This was reflected in the dominance of “hold the line” strategies, using the language of “defense” and “protection,” and was highly reliant on coastal engineering structures such as sea walls (Ballinger, 2015). Such approaches have been critiqued as perpetuating a cycle of development and defense and being dominated by local and short-term perspectives (RCEP, 2010). Faced with these shortfalls, nations such as the United Kingdom have embraced a paradigm of minimizing risk wherein levels of acceptable risk are calculated and approaches such as cost–benefit analysis (Hanley, 2001) are used to prioritize investments. Risk has thus become embedded within public perceptions of climate change and state responses to its impacts.

Globally, rising sea levels are threatening land-based territories in estuaries, atolls, and low-lying coastal areas. In response, states have attempted to “fix the edge at a moment in time” (Yarina & Takemoto, 2017, p. 461) utilizing structures such as sea walls. Drawing upon Müller-Mahn (2012), Yarina and Takemoto (2017) engage with the concept of the “riskscape”—a multi-layered landscape in which spatial risk intersects with the perceptions, knowledge, and imaginations of the inhabitants of that space—in order to understand Tuvaluan state approaches to coastal adaptation, which include hard engineering such as sea walls. They argue that to encompass a wider range of possibilities for coastal communities, it is necessary to reconceptualize “climate-proofing” and “solution-oriented” approaches to climate change adaptation. As such, perceptions of risk—or perceptions of low/no risk (Kelman et al., 2019)—are key factors for understanding diverse motivations for (im)mobility in response to rising sea levels, regardless of the agency of individuals and communities to act upon these motivations. A key issue affecting risk perception is that ecosystem services and the “socio-ecological systems” (Mallick, 2019) within which they exist are more likely to be “degraded” by “slow onset” environmental phenomena (Black et al., 2011), making it harder for the affected populations to perceive the threat in comparison to sudden onset disasters such as earthquakes and flash floods. Biases or constraints in information processing can significantly influence risk perception and decision-making. For example, there is often a tendency to discount future damages and harms to others in favor of present damages and harms to self and close relations, or by discounting mental harm in favor of preventing physical damage (Pearson et al., 2023). More widely, Johnson et al. (2021) have pointed to the frequently contested nature of quantifying risk and how it is too often open to interpretation from competing stakeholders (Ferris, 2011; Johnson et al., 2021; Wilkinson, 2021). Further, these perceptions are not static and can evolve over time (Wilkinson, 2021).

Law is typically a backward-looking discipline, and this shapes its approach to risk. It predominantly responds to harms that have already occurred, as opposed to pre-empting future risks of harm. Through its mechanisms of causation and precedent, the law attributes responsibility for harms experienced by a “victim” complainant/applicant. But, after a hesitant start, judicial and quasi-judicial bodies are increasingly looking forward in the context of the effects of climate change.

In July 2022, for example, the UN Human Rights Committee found violations of the International Covenant on Civil and Political Rights by Australia with respect to members of an indigenous minority group of the Torres Strait Islands. Specifically, the Committee found violations of Article 17 with respect to home, private life and family (UN Human Rights Committee, 2022, para 8.12) and Article 27 on the right of minorities to enjoy their own culture, and to profess and practice their own religion (UN Human Rights Committee, 2022, para 8.14). While the latter is of narrow application to ethnic, religious or linguistic minorities, the former is broader. The Committee particularly noted a failure by Australia to “discharge its positive obligation to implement adequate adaptation measures” in a timely fashion (UN Human Rights Committee, para 8.12; Voigt, 2022, p. 2), measures that might have prevented such harms as experienced by the authors from occurring to their private life and culture. While the Torres Strait example illustrates the law’s willingness to engage with climate change harms, it does little to advance the jurisprudence on future harms. Climate change, and advances in predictive science in general, pose a challenge to law by making it possible to foresee with ever-increasing certainty that harms that have not yet occurred will occur in the future. This is particularly challenging with respect to immobility, especially when it is framed as voluntary (Robins, 2022a).

But this does not mean that the law cannot or should not play a role in dealing with future risk in the context of climate change (Hilson, 2009). As Heri (2022) rightly notes, international human rights law already engages with questions of risk in the context of predicted future harms, specifically with respect to planned deportation. The European Court of Human Rights (ECtHR), for example, has a now well-established line of Article 3 jurisprudence ruling on the risk of torture or inhuman or degrading treatment or punishment should an individual be subsequently deported. A finding in favor of an applicant acts as a legal bar to their deportation. International human rights law thus has the tools and the willingness to engage with future harms, and to require States to act in certain ways to prevent such future harms. Nevertheless, any legal obligation is only triggered once severity and immediacy thresholds are reached, and these thresholds are high (see, e.g., *M.S.S. v Belgium and Greece* [ECtHR], 2011). Specifically, there must be “substantial grounds” for believing a person would face “a real risk” of treatment contrary to the right to life and the prohibition of torture or inhuman or degrading treatment or punishment (ECtHR, 2022). Needing to wait until this point is reached in respect to climate change is questionable, not least of all morally.

At the national level, Peru provides a rare and innovative legislative approach in its 2011 law on preventive and post-impact resettlement. As Johnson et al. (2021) explain, if the relevant authorities declare a locale a “non-mitigable risk area,” resettlement can take place. While this provides a legislative vehicle through which authoritative decisions on preventive resettlement can be made, the risk evaluation that determines the resettlement decision makes scant use of qualitative information. Moreover, community participation and consultation are of only secondary importance rather than influential to resettlement decisions (Johnson et al., 2021). Therefore, while legal avenues may exist, such avenues as currently conceptualized and operationalized are insufficient to deal with predicted climate harms.

Empirical research examining the risk of health impacts of climate change rarely focuses on immobile populations. Yet populations living in sites of climate risk can experience adverse health impacts from changes in water and food security, disease ecology, flooding, and saltwater intrusion, as well as psychosocial impacts from disrupted livelihoods (McMichael, 2020). Nor has much consideration been given to potential positive health and well-being impacts (Adams, 2016), beyond some focus on the benefits of strong place attachment’s role in decision-making in the midst of environmental stresses (Best et al., 2022). Many reasons—sociocultural, political, psychosocial, medical—can justify immobility and override technical assessments of the benefits of relocation, but without validation from official access to appropriate support they may be difficult to implement (Farbotko et al., 2020). Community immobility might well be an adaptive response to what is perceived as an environmental challenge rather than a threat, it can entail positive mental health and psychosocial outcomes such as protected identity, utility, attachment, and social bonds, as well as potentially increased community competencies and social cohesion. The intersection of climate change, immobility, and health impacts, including mental health, requires interdisciplinary focus and research (Adams, 2016; Farbotko et al., 2020).

3.2 | Immobility and (mal)adaptation

Within climate change governance, adaptation refers to the changes to socio-economic and environmental systems that are required in response to current, or expected, shifts in climate to reduce harm and damages and maximizing any future opportunities (UNFCCC, 2020). In the context of threats to coastal settlements, for instance, a range of policy responses have been promoted for climate adaptation (Figure 1).

Many adaptation strategies can be translated into practicable schemes and classified according to various typologies (Biagini et al., 2014):

1. Advancing the coast via land reclamation;
2. Defense of the shoreline via hard (e.g., concrete armoring or seawalls) or soft engineered infrastructure (e.g., sand nourishment);
3. Nature-based solutions such as managed realignment, which set-back lines of defense but reduce flood risk via habitat creation;
4. Retreat involving relocation of infrastructure or people; flood warning or insurance schemes to mitigate risk; or
5. Accommodation of infrastructure via design to increase protection (Koerth et al., 2014) or embrace inundation (Barsley, 2020).

Strategic Response	Example	Consequences	(Im)mobility implications
Advance	Land reclamation	Expensive to build and maintain. Limited lifespan. May encourage future development in low lying areas. Local environmental degradation.	Geopolitical narrative of 'resistance' Facilitates wider adaptation and community resilience (e.g., food security).
Defend ('Hold the line')	Hard or soft engineering	Expensive to build and maintain. Local environmental degradation.	Often seen as the preferable option or populations who wish to remain in situ
Realign (Retreat)	Nature based solutions and setback line of defense	Improves ecological and amenity outcomes. Less significant flood risk reduction compared to hard engineering.	Redistribution of flood risk Increased community benefits such as access to amenities
Relocate	Removal or migration	Social impacts from disruption of population distribution. Expensive to manage on a large scale.	Change of community and lost sense of place for individuals and groups. Loss of 'immobile' forms of economic subsistence and local/indigenous knowledge.
Mitigate Risk	(Flood) warning systems or (flood) insurance	Does not address the fundamental hazards.	Involves some acceptance of risk and may have health and wellbeing implications.
Accommodate (Embrace)	Engineer for inundation	Expensive to build High risk for populations.	New mentalities of living with risk, change to buildings and lifestyles.
Decommissioning/ Do nothing ('No active intervention')	Abandonment of settlements or structures	Low costs and allows natural processes to operate. But unpopular and raises questions of fairness.	Passive approach which avoids the issue.

FIGURE 1 Typology of coastal adaptation. *Source:* Authors' analysis, based on IPCC (2019, p. 42) and IPCC (2022).

The effectiveness of such schemes is often evaluated against a control “do nothing” strategy that allows environmental processes to unfold and concedes that eventually “technical limits to hard protection are expected to be reached under high emissions scenarios” (IPCC, 2019, p. 57). This raises difficult political questions about future mobility and immobility in coastal communities. Moreover, it is important to distinguish between different forms of mobility in relation to climate change. Scholars have argued that managed retreat must be treated differently from climate migration, including autonomous environmental migration. Unique mechanisms underpin managed retreat, including the deliberate nature of the intervention; legal protections, rights regimes and funding structures; discursive effects, implications for land use, and exposure to risk (Ajibade et al., 2020; Hino et al., 2017). Still, despite increased risks for future climate vulnerability, development including residential housing continues to occur in high-risk coastal areas in the United Kingdom and beyond (Adcock, 2017).

Recently, Wiegel et al. (2019) have interrogated “the discursive binary” of “climate refugees” and “migration as adaptation.” Focusing on individual, familial and community climate change adaptation and its links with (im)mobility, they instead adopt a “mobilities perspective.” They explore mobility and immobility and their links to environmental change, drawing special attention to a “wider context of social, political, and economic inequalities” (p. 2). In this vein, this section examines the ways in which immobility (as opposed to migration) can be framed as an adaptive response to environmental change in general (Hjälml, 2014) and to environmental risk specifically (Mallick, 2019; Zickgraf, 2018). This is often because of the place specificity of financial and social capital (Fischer et al., 2000) that combine to create a sense of place attachment that may also coincide with cultural ties—or place specific forms of cultural capital (Bourdieu, 1986)—to an area (Farbotko & McMichael, 2019; Zickgraf et al., 2016). The place specific nature of these forms of capital, what Mallick et al. (2021) term “immobile capital” (p. 6) mean that the affected individual/group is often best equipped to adapt to environmental risk at the site of risk itself (Mallick & Schanze, 2020).

In her analysis of a series of planned relocations, Ferris (2011) shows that even when faced with dangerous situations in-situ, such as frequent flooding, people often choose to remain, illustrating the higher tolerance for environmental change associated with strong place attachment (Best et al., 2022). Similarly, Johnson et al. (2021) found that in Uganda, the decision to stay at the site of risk was “a trade-off between the opportunities or benefits that the location provides and the risks or costs of living with frequent flooding events” (p. 85). This phenomenon has been reflected in the policy decisions in places like the Netherlands seeking to discourage emigration from “at risk” areas (Zickgraf, 2018).

Regardless of whether adaptations involve migration or non-migration, adaptation is expected to alleviate some harmful impacts of climate change. Planners and politicians assume a community will incur fewer climate change related losses after adaptation (Hall et al., 2012). Kucklicke and Demerit (2016) find a tension between adaptive strategies that embrace uncertainty or policy flexibility and risk-focused strategies that aim to quantify uncertainty into risks that can be “rationalized through cost benefit analysis” (p. 56). Adaptive strategies may offer a greater degree of dynamism and plasticity than risk focused responses. Poorly thought-out strategies can be maladaptive, however, as “when an action results in conditions that are worse than those which the original strategies were trying to address” (Schipper, 2020, p. 409). Moreover, the impact of poorly designed adaptations will often be worse for the most disadvantaged communities or individuals and can exacerbate existing disadvantages by creating “intervention generated inequalities” (Lorenc et al., 2013, p. 190).

For instance, in Kiribati, the Kiribati Adaptation Program’s main achievement was the completion of seawalls that within a few months were damaged, causing adjacent beach erosion that then threatened the freshwater infrastructure of South Tarawa, Kiribati’s capital (Donner, 2015). Too often, scholarship within the broader social sciences neglects the role of politics and power in adaptation, considering it merely a technical and environmental matter (Mikulewicz, 2018). Technical and policy solutions to climate change must instead be considered in a wider political context, remaining mindful of existing power structures and political inequalities.

As a political process, adaptation shapes vulnerability and the targets of adaptation efforts (Nightingale, 2017). O’Brien (2012) has identified the need for human geography literature that both accommodates and contests change, creating alternative imaginaries of environmental justice. Indeed, Moser (2010) states that geographers must continue their interdisciplinary endeavors on climate research, particularly in response to the need for work on vulnerability and adaptation. Through their focus on space, place and power, geographers are well placed to question the politics of immobility and to contribute through interdisciplinary collaborations. to the identification of the legal and public health questions that arise from changing coastal landscapes.

From a mental health and psychosocial (MHPSS) perspective, the “boundary” between adaptive and maladaptive psychological responses “is indistinct and fluid, varying in time, context and culture” (Silove, 2013, p. 236).

Fundamentally, an individual's adaptive capacities (including resilience, discussed below) change and develop from birth through the processes of biobehavioral synchrony that characterize human sociality and affiliation (Feldman, 2020). Lwasa et al. (2021) point to the non-monetary costs of resettlement “such as ... physiological and social consequences, and disruption of social cohesion” (p. 96). To complement Lawasa's research it is also important to account for individual and communal mental health impacts of such resettlements and to use appropriate frameworks in fieldwork to do so. The “social world mirrors and interacts with the personal/psychic world, creating a process of recursive, or looped, feedback” and, in a context of rapid and unpredictable change, regular re-appraisals are required to understand the dynamic interactions among individuals, groups, and the evolving eco-psycho-social context (Silove, 2013, p. 236). Seemingly maladaptive reactions may in fact be adaptive in abnormal situations. Different cultures and subcultures may view different reactions as adaptive or maladaptive (Bhui, 2022; Silove, 2022), reinforcing the need to listen to the experiences of those involved (Nayna Schwerdtle et al., 2021) and to enable community participation through frameworks and models that are culturally sensitive.

For example, the IC-ADAPT framework, an integration of two evidence-based psychosocial models, links five psychosocial societal systems (safety and security, bonds and networks, justice, identities and roles, existential meaning) with communal and individual mental health and psychosocial reactions to environmental challenges and threats and resulting adaptations (Boyd-MacMillan & DeMarinis, 2020; Cambridge University Press & Cambridge Assessment, 2020; Silove, 1999, 2013). As a culturally sensitive and contextually adaptable framework, it provides an example method that could be used to access community experiences of immobility, to increase understanding of adaptation and resilience in contexts of climate change, and to enable genuine communal participation in the decision-making processes about community and geopolitical responses.

Other resources within the field of public mental health promotion that support community participation during eco- and psychosocial assessment include the Community Readiness Assessment (CRA) model (Wells et al., 2020) and the Cultural Formulation Interview (CFI) protocol (American Psychiatric Association, 2013; Lewis-Fernández et al., 2016). If we wish to alleviate harmful impacts from climate change while protecting and supporting social capital and social cohesion in ways that increase environmental justice, we will need to use such public mental health promotion resources to access individual and community reactions and generate participatory decision-making processes. In summary, poorly designed and implemented climate change adaptation can, in fact, be maladaptive in nature and therefore undermine resilience and exacerbate vulnerabilities.

3.3 | Immobility and resilience, protection, and vulnerability

Resilience is a fluid, complex and at times problematic term to define in relation to environmental change. It suggests a promise of living with, and potentially even reaping benefits from, a changing physical environment (Grove & Chandler, 2017). As Chavez Eslava writes, “resilience includes not only adjustments to environmental changes, but also resistance and recovery when encountering climate variability, particularly when faced with the effects of extreme events” (2021, pp. 164–165). Yet some forms of resilience can also be maladaptive, when the outcomes are perverse (Chavez Eslava, 2021). The proliferation of resilience within environmental governance discourses has even been seen as reflecting the normalization and neoliberalization of inevitable climate change and of climate migration (Methmann & Oels, 2015). Geographers have been critical about how resilience, along with vulnerability, are often buzzwords that can be enrolled into projects to merely serve as justification for academics and practitioners to address their own priorities (Kelman, 2018). Resilience in relation to climate change adaptation has been critiqued due to its de-politicizing effect and association with neoliberal governance (Grove & Chandler, 2017). Many scholars have argued that Western construction of climate resilience in small island developing states can create an ontological trap that shifts resources away from short term and local development trajectories and objectives (Baldacchino, 2018). Underlying political agendas on migration and mobility can be concealed by de-politicized and technocratic discourses of climate change migration, as seen in the Maldives (Kothari, 2014), where the government has proposed consolidating the dispersed Maldivian population from 200 islands onto 10–15 islands to facilitate climate adaptation. This relocation has long been seen as desirable by the Maldives' Government as an economic, rather than environmental, justification to provide services more efficiently to the population (Kothari, 2014).

“Resilience” has varied definitions across disciplines, but in the field of public mental health promotion, it generally refers to resources or capacities an individual can draw on in the face of adversity (Connor & Davidson, 2003; Richardson, 2002). Such biopsychosocial and affiliative resources or capacities can both protect a person against risks of

mental distress and promote well-being and mental health. Expanding this understanding to encompass multi-leveled, interrelated processes operating at the individual, interpersonal/social, and communal levels (Kirmayer et al., 2010) can affirm the survival skills of those experiencing adversity. Assessing resilience only on an individual level with intrapersonal measures does not provide an adequate picture of the actual, situational level of resilience; a fuller understanding of resilience requires consideration of interpersonal (social and community) resources (Cetrez et al., 2021). Recent and forthcoming research explores the complementary relationship between resilience and resistance as distinct but related constructs that can be measured at the individual, interpersonal, organizational, and collective levels and are essential for understanding well-being during adversity (e.g., Singh et al., 2024). This research focuses on frontline workers who stay on the job during severe structural adversities, emergencies and crises, but expanding this conceptualization to populations on the frontlines of slow onset environmental adversities could reveal new insights about adaptive resilience during climate change.

Although resilience is gaining traction in law literature, it is nonetheless underdeveloped, lacking in precise meaning. Reviewing law and resilience literature, Humby (2014) identifies resilience as “the necessity of dealing with uncertainty, surprise and complexity at multiple scales.” Moreover, as Humby asserts, “the relationship between resilience, adaptive management, and adaptive governance to environmental human rights and environmental justice does not appear to have been explored at all.” Yet, this need not be an obstacle to expanding its use in law. The concept of vulnerability, which Aguirre (2007) posits is bound to resilience in a dialectical relationship, is similarly ill-defined and multi-faceted (Hudson, 2018), yet it has nonetheless swiftly moved from a position of relative obscurity to become a common feature of jurisprudence in the context of migration, particularly under the European Convention on Human Rights (ECHR) (Flegar, 2016; Timmer, 2014).

However, the application of the vulnerability concept in judicial proceedings at the European Court of Human Rights (ECtHR) is plagued by essentialism and paternalism (Hudson, 2018; Peroni & Timmer, 2013). In response to such tendencies, several United Nations human rights treaty bodies have, in a joint statement on human rights and climate change, asserted that persons such as women and children should not be seen only in terms of vulnerability, but “should be recognized as agents of change and essential partners in local, national and international efforts to tackle climate change” (UN, 2020). It is here that resilience has particular potential. Resilience could be deployed as a complement to vulnerability, as a way to moderate the judicial tendency to apply the vulnerability concept in a manner that disregards agency and autonomy, at both the individual and the community/societal levels.

Resilience as a conceptual frame, when compared to vulnerability, can be less about labeling and compensating for supposed flaws in an individual, and more about initiating co-designed, forward-looking interventions that enhance the resilience of individuals and communities. Judicial decisions on resilience strategies have the potential to catalyze action by the State, which is especially important in the climate change context where authorities can be hesitant to act even when called upon to do so by affected communities (Buser, 2020; Ferris, 2011; Hino et al., 2017).

The theoretical framework proposed by the 2011 UK Foresight report has been accused of moving away from the collective socio-environmental context that may have contributed to environmental displacement and toward a mindset that focuses upon an individual's capacity or ability—and thus responsibility—to adapt (Ayeb-Karlsson et al., 2018; Baldwin, 2016; Felli & Castree, 2012). This coheres with an individualistic understanding of resilience instead of the multi-leveled processes outlined above. As a result, immobility may then be classified by some policy makers as a maladaptive response to climate change and indicative of a lack of resilience. This ignores those who are adversely impacted by mobility and become immobile or “stuck” in camps or slums (Ayeb-Karlsson et al., 2020). It also ignores cases where the preference for immobility itself is a form of adaptation to risk. On the other hand, Mallick's (2019) research on the (non)migration decisions of members of coastal communities in Bangladesh explicitly links resilience to immobility. Defining “livelihood resilience” as “an individual household's ability to absorb and recover from disturbances due to unexpected events and to adapt to the post-event condition” (p. 1), he found that “resilient people” were more likely to want to stay, but that this was also highly dependent on the socio-ecological context in which they lived. This points to the issue that it is not only the differential vulnerability of people that needs to be considered but also the “differential vulnerability of places” (Nawrotzki & DeWaard, 2018, p. 534). Indeed, as Nawrotzki and DeWaard point out, “there is surprisingly little research on the characteristics of places that trap, or immobilize, populations,” which they refer to as “the holding power of place” (Nawrotzki & DeWaard, 2018).

Regarding legal protection, it is tempting to consider expanding the 1951 definition of a refugee to include recognition of environmental displacement. But caution must be exercised for multiple reasons. The 1951 definition is at its core concerned with international migration resulting from persecution, it cannot easily accommodate environmental displacement without this additional persecutory element. While arguing for the validity of “climate refugee,” Gemenne

(2015) has claimed that climate change itself is “a form of persecution against the most vulnerable ... [so] ... these migrations are the result of a persecution that we are inflicting on the most vulnerable” (p. 71). This argument fails to stand up to scrutiny, since for “persecution” to be meaningful here, climate change would need to have been deliberately orchestrated with the explicit intention of increasing the suffering of specific vulnerable groups, which seems far-fetched.

Gemenne's argument aside, since most environmental displacement is limited to internal movement—without international borders being crossed—it is difficult to apply the category of refugee. Even in the case of sudden onset climate hazards, such as flash floods, most movement is short term and short distance (Cundill et al., 2021). The displaced will likely move back to the affected sites much faster than is the case in instances of forced migration due to conflict. Further, to define the category “climate refugee” or “environmental refugee” too widely risks making the category of refugee itself less meaningful. Lister (2014) rejects calls to expand the category, arguing refugees remain a normatively distinct group as they are owed particular duties from the international community that can only be met if they are granted refugee status in a third country. Further, it is very difficult to define what counts as forced migration where the sole or at least primary factor was due to slow onset climate hazards (Dun & Gemenne, 2008). Researchers have long argued that environmental issues need to be considered alongside other factors and attempts to create “climate change” as the sole or primary motivation for migration too often do not stand up to scrutiny (Black et al., 2011; Dun & Gemenne, 2008; Perch-Nielsen et al., 2008).

A larger conceptual problem for defining the “climate refugee” as a legal category is that there is good evidence that climate change can inhibit migration in some areas just as easily as it increases migration in others (Nawrotzki & Bakhtsiyarava, 2017). This may prove a graver problem for affected areas given the important role that migration can play in local development (i.e., from remittances and skills acquired abroad and brought back to the place of origin). Again, this points to the fact that policy and aid aimed at adapting to climate must recognize the likelihood of (forced) immobility becoming a more pressing issue than forced mobility. Claims that climate change will result in mass migration of hundreds of millions of people (Myers, 1993, 2002; Stern, 2007) must continue to be examined critically. Indeed, most leading experts have largely dismissed such estimates as a myth (Wiegel et al., 2019). Still, (quasi-)judicial bodies have recently begun to recognize environmental hazards as a contributing factor in forced migration (United Nations, 2020). Although such decisions are still far from universal, they do indicate a potential avenue toward legal recognition of the role that environmental hazards can play in people's migration decisions.

In defining vulnerability, alongside dependence on specific natural resources and socio-economic status, other demographic characteristics such as population growth rate may inform a group's (or individual's) status as “vulnerable” (Zickgraf et al., 2016). Some scholars have called attention to the socially and politically constructed aspects of vulnerability, arguing that “state interventions to address vulnerability are often crafted through both ‘who is identified as vulnerable’ and ‘who identifies the vulnerable’,” (Gajjar et al., 2019, p. 49). To be designated “vulnerable” can also rely on self-identification. This echoes Johnson et al.'s (2021) earlier observation in Section 3.1 that risk is subjective. It is thus important to consider how those affected perceive the severity of the threat since this may not align with the views of “experts” from outside the community (Johnson et al., 2021; Mallick & Schanze, 2020; Zickgraf et al., 2016). As Zickgraf (2018) writes, “[t]he need to migrate is ... a relatively slippery notion. What the ... researcher assesses as a physical threat may not align with the perceived risk of the affected individual, household or population” (Zickgraf, 2018, p. 74). Thus, there may be times when those who remain “voluntarily” may be more vulnerable than those who are involuntarily immobile (Zickgraf, 2018). The immobility of people facing climate change related risks may seem illogical to some. By not conforming to another's understanding of adaptation or resilience such people can be subject to interventions intended to facilitate mobility rather than to support a full range of adaptive and resilient responses to local and global environmental flux (Ayeb-Karlsson et al., 2018; Grove & Chandler, 2017). Finally, vulnerability must be understood in its temporal dimension, which has led Gajjar et al. (2019) to call for “understanding vulnerability beyond the present” (p. 49).

To broaden our understanding of resilience, protection, and vulnerability in the face of climate change risks we will need to explore the geographical, legal, mental health-psychosocial and public health complexities that scaffold human relationships with local nature and global climate. Supporting community members' knowledge, capacities, and skills strengthens community resilience (Chapman & Larsson, 2019). This includes supporting problem awareness (e.g., comprehensive risk and vulnerability assessments that include community psychosocial health and well-being), exploring potential solutions (e.g., via social learning and self-organization to consider a range of alternatives), and enacting interventions through policies and programs that in turn further build adaptive capacity (e.g., via participatory community engagement and consent; social mobilization; community-based planning and organization) (Árvai &

Gregory, 2021; Chapman & Larsson, 2019; Pearson et al., 2023; Romsdahl, 2020). Multi-sector, multi-disciplinary understanding of these processes is essential for the safety and well-being of individuals and communities (Árvai & Gregory, 2021; Chapman & Larsson, 2019; Pearson et al., 2023; Romsdahl, 2020). Resilient communities have the capacity for collective action and a sense of empowerment that allows them to respond creatively and flexibly to challenges through political structures and grass-roots level organizing (Árvai & Gregory, 2021; Chapman & Larsson, 2019; Pearson et al., 2023; Romsdahl, 2020). People living in resilient communities report strong bonds among members, active participation in diverse and effective organizations (Árvai & Gregory, 2021; Chapman & Larsson, 2019; Pearson et al., 2023; Romsdahl, 2020), and deep attachments to place (Best et al., 2022; Cutter et al., 2008).

If communities believe they have resources that nearly meet or exceed what is demanded in a situation, (e.g., high place utility and social cohesion), then they will tend to view that situation as a challenge rather than as a threat. An appraisal of challenge is associated with positive emotions and complex, flexible, socially cohesive reactions, whereas appraising an environmental stressor as a threat is associated with negative emotions and binary, rigid, polarizing reactions (Andrews Fearon & Boyd-MacMillan, 2016).

Mallick et al. (2021) use Protection Motivation Theory (PMT, Rogers, 1975) to examine threat and coping appraisals in the decision-making processes of Bangladeshi coastal residents, for whom complex coping resources related to place attachment strongly outweighed threats and risks of staying. While revealing the “reasons behind the rationales” at the individual level, PMT does not consider the role of cultural, religious, and spiritual influences. Continued work is needed to understand non-migration decisions at individual, interpersonal/social, and communal levels. Strengthening community resilience and participation in decision-making can enable members to consider and integrate a wider range of viewpoints and possibilities, and lead to novel responses that can inform climate change responses elsewhere. Enabling access to support regardless of communities’ decisions should be an international mandate.

3.4 | Immobility, interdisciplinarity, and “wicked problems”

Immobility presents new challenges to environmental governance, necessitating an interdisciplinary approach that addresses how risk, adaptation, resilience, and vulnerability have legal and public health implications. Social scientists are well placed to study these phenomena, as seen in coastal communities facing sea level rise (Stirling, 2003). Interdisciplinary research, using mixed-methods approaches, can help us understand how perceptions of social, economic, political and environmental issues have implications for law, health and a community’s sense of place. Siders (2019, p. 221) adds that “research on managed retreat will require interdisciplinary collaborations (e.g., psychologists, communication experts, economists, lawyers, ecologists, engineers, and disaster scientists)”. Participatory research methods allow researchers to better understand the lived experiences of affected communities and ensure that they address questions of climate justice, which are critical in designing successful policy for immobile populations. Successful climate risk management and broadened civic engagement can be achieved through community-based participatory research and structured decision-making processes that integrate scientific analyses and community deliberation (Árvai & Gregory, 2021; Pearson et al., 2023; Romsdahl, 2020).

Below we have summarized the key aspects, differences and points of connection between interpretations of these concepts by the three disciplines (Figure 2). These points of connection can be used to explore how issues around climate change and immobility can be understood as a “wicked problem.” Climate immobility poses a unique problem, symptomatic of the wider environmental crisis with no clear set of solutions and no opportunity to learn by trial-and-error (Rittel & Webber, 1973). Moreover, since socio-economics shape the mobility-immobility spectrum, there are bound to be equity issues. and contradictory worldviews on whether migration can serve as a form of adaptation or not. Indeed, as argued by Levin et al. (2012), climate change is a “super wicked problem” with no central authority, where those attempting to solve the problem are also contributing to it, while policies irrationally discount the future and time is running out.

4 | DISCUSSION AND CONCLUSIONS

This concluding discussion contains three parts. The first considers how risk, (mal)adaptation, resilience, protection, and vulnerability relate to each other in the context of environmental immobility. These relationships are explored from the perspectives of public health, law, and policy. Part two discusses possible directions for future research on the links

	Geography	Public/ Mental Health	Law
Immobility and Risk	Politicisation of risk Sense of place	Social and health inequities linked with higher physical/ mental health and asset risks; more focus on disasters than slow onset; informed by social representations of risk	Typically reactive, post-harm; demands a “victim”; high severity and immediacy risk thresholds
Immobility and (Mal)adaptation	Immobility as adaptation mobility as maladaptation	Migration/ mobility the focus, immobility considered as ‘non-migration’, yet both considered in relation to inequalities, disabilities and place attachment; adaptation understood in terms of biopsychosocial functioning, enabled or hindered by local/ national structures and systems	Immobility as the status quo, mobility as maladaptation
Immobility and Resilience, Protection and Vulnerability	Depoliticization of resilience, resilience as maladaptive, individualization	Social and physical/ mental health inequities increase vulnerabilities; protective factors function on individual, familial and community levels; resilience refers to multi-levelled, mutually influencing processes at all three levels	Under-developed and ill-defined; universal in theory, yet group-based in application; essentializing and stigmatizing

FIGURE 2 Commonalities and differences between disciplines.

between immobility and climate change. It argues that an interdisciplinary perspective is not only useful but essential when tackling environmental immobility. Part three suggests new geographical locations for future research on environmental immobility, which has to date predominantly focused on the Global South.

4.1 | Reflecting on risk, (mal)adaptation, resilience, protection, and vulnerability

Boyd-MacMillan and DeMarinis (2020) argue that risk reduction requires supporting well-being, strengthening individual and community resilience, and increasing social and emotional competencies among all at risk from and responding to disasters. They modify the internationally recognized mental health and psychosocial (MHPSS) “pyramid of care” to include whole affected populations in the provision of social and emotional support—without reference to specific reactions to disaster, across the life course (Mavrodaris et al., 2022). This modification avoids the binary formulations of risk, (mal)adaptation, vulnerability, and protection that have been explored in this paper and places all

affected by slow or rapid onset of climate hazards within an international framework of psychosocial care and support, regardless of (im)mobility.

Similarly, Adger (2016, p. A3) argues that the political economy of concepts of “place, well-being, and fairness” must play a fundamental role in policy decisions aimed at adapting to climate change. Researchers and policy makers must critically interrogate how “fairness” and “well-being” are defined, interpreted, and measured. We have emphasized that immobility can often be an expression of resilient adaptation in an adverse situation. Mallick's (2019) finding that the most “resilient” are least likely to move resonates here—linking resilience to strong place attachment and multi-leveled ties to community. By choosing to support existing economic, social, and cultural capital, a resilient collective might find ways to adapt to the effects of climate other than to move. To return to Adger (2016) people's desire for immobility is intimately linked to well-being in place. Further, while high satisfaction and strong place attachment can motivate immobility (Adams, 2016), losing a sense of place can provoke the loss of a sense of functioning, and compound adverse effects (Draper & McKinnon, 2018). As Adger (2016) reminds us, any adaptive responses that demand mobility must consider a sense of fairness. He warns that “when the burden of adaptation is perceived to be unfair, then action will not be legitimized, and interventions simply will not happen” (p. 3). If a community decides to stay, can innovative, multi-sector support be mobilized to support it or do the relevant conceptualizations of resilience and adaptation disallow this possibility and thus close off the discovery of novel adaptive responses? As Adams (2016) notes, “governments should not make assumptions a priori about whether a location is undesirable and promote migration as a blanket solution to the negative impacts of climate change” (p. 445). Even in cases where it is not deemed economically “viable” for a population to remain in a given place, “the non-economic benefits of place ... cannot be over-estimated” (Adams, 2016). Ultimately, movement must not be assumed to be harmless; as Ferris (2011) asserts, “the fact is that communities suffer when they are moved” (p. 3).

4.2 | Future research on climate change, immobility, and displacement

Interdisciplinary research is uniquely placed to study how a reconceptualization of risk, (mal)adaptation and resilience might refine our understanding of environmental immobility, galvanize new research agendas and inform the development of policies that foster contextually adapted responses to environmental risks. It is established that those who migrate because of climate change related phenomena such as flooding and sea level rise, often suffer significant public health impacts. In particular, the impact of climate change on mental health has growing recognition. The 2022 Intergovernmental Panel on Climate Change (IPCC) Report was the first to highlight such links between mental health, rising temperatures, and extreme weather events. A year earlier, the Mental Health Foundation participatory event at the UN Climate Change Conference (COP 26) noted three types of mental health effects from climate change (Wilson & Rae, 2022): direct consequences, indirect consequences (observing effects on others and anticipating effects on self/family/community), and social consequences (global long-term economic and societal impacts). Yet, policy has focused on displacement and migration, with too little attention paid to those who, for a range of reasons, do not migrate (Schewel, 2019; Zickgraf, 2018). As this article has demonstrated, there is a need for public health researchers with an interest in the effect of climate change on displacement to focus on immobile populations facing the same environmental pressures as those that do move. This reflects a wider need to examine how the concept of displacement applies to the immobile.

Similarly, the law with respect to displacement has until recently addressed cross-border forced migration, namely refugee movements, which occur as a consequence of persecution on the basis of the finite list of civil and political causes addressed in the 1951 Refugee Convention. Such a focus has rightly come under increased scrutiny as the reality and scale of displacement in other contexts, including “natural” (Kelman, 2020) disasters has become more apparent and obvious (see, for example, the 2011 Nansen Principles on environmental-induced cross-border displacement). In 1998, the UN Guiding Principles on Internal Displacement were adopted as a minimum international standard applicable to those who are forced or obliged to leave their homes and go to another place within internationally recognized State borders. In contrast to the treatment of refugees in international law, internal displacement is more broadly conceptualized, with any persecutory requirement discarded, and explicit recognition of environmental-induced displacement included in its non-exhaustive list of displacement causes. A key priority for legal scholars interested in migration studies should be the development of appropriate legal protections for immobile persons in the context of climate change, thus taking seriously the reality that immobility, like mobility, can be forced (Ali, 2022; Carling, 2002). Due attention must be given to the human dynamics, in particular the human rights implications of immobility. Further

research is needed to understand law's role not only in responding to but also in creating and constructing situations of (im)mobility, vulnerability, and resilience. Law would also benefit from greater engagement with contemporary literature by geographers, which often challenges the “naturalness” of disasters and emphasizes how hazards can be exacerbated or created by human activity (Kelman, 2020).

4.3 | Future research on immobility and climate change in the Global North

In 2018, Zickgraf noted the lack of research on environmental immobility (p. 74). Since then, progress has been made in studying its drivers and implications, but the focus has been mainly on the Global South and little attention has been paid to the relevant law in developed states. Slow onset climate hazards are a global phenomenon and as such, more Global North field sites should feature in future investigation. Such research would allow Global North researchers and policymakers to learn from their southern counterparts. For example, Fiji—a country which must respond to flooding and sea level rise—already has a set of best practice policy guidelines in place regarding the issue of managed relocation of coastal populations (Ministry of Economy, Republic of Fiji, 2018). In a UK context, Fairbourne is perhaps one of the most well-known settlements at risk of both sea level rise and flooding, with members of its population that are unwilling and/or unable to relocate (Buser, 2020). Fairbourne is important because it is the first time UK citizens have been designated (albeit inaccurately) as “climate refugees.” Further, it is likely to be the first of many such cases around the United Kingdom. The UK's Environment Agency recently announced that “managed” relocations will be “inevitable” in the future (Bevan, 2022). Without a coherent set of best practices that include the affected communities (that are often among the most vulnerable in society) in decision-making processes, the United Kingdom and other developed countries will be less resilient in adapting to climate change.

5 | CONCLUSION

NB. The discussion (Section 4) includes our conclusions.

AUTHOR CONTRIBUTIONS

Daniel Robins: Conceptualization (equal); data curation (equal); formal analysis (equal); investigation (equal); methodology (equal); project administration (lead); resources (lead); writing – original draft (lead); writing – review and editing (lead). **Liam Saddington:** Conceptualization (lead); data curation (equal); formal analysis (equal); funding acquisition (equal); investigation (equal); methodology (equal); project administration (equal); writing – original draft (equal); writing – review and editing (equal). **Eolene Boyd-Macmillan:** Conceptualization (equal); data curation (equal); formal analysis (equal); funding acquisition (supporting); investigation (equal); methodology (equal); project administration (supporting); resources (equal); writing – original draft (equal); writing – review and editing (equal). **Tim Stojanovic:** Conceptualization (supporting); data curation (equal); formal analysis (equal); investigation (supporting); methodology (equal); resources (equal); writing – original draft (equal); writing – review and editing (supporting). **Ben Hudson:** Conceptualization (supporting); data curation (supporting); formal analysis (supporting); funding acquisition (equal); methodology (supporting); writing – original draft (supporting). **Louise LaFortune:** Writing – original draft (supporting); writing – review and editing (supporting).

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The authors declare no conflicts of interest.

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Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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ENDNOTE

¹ For a discussion on the problems with the terms “forced” or “involuntary” migration see Erdal and Oeppen (2018) as well as Lubkemann (2008).

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