Comparative Migration Studies

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The elusive climate migrant: symbolic geographies in migration studies

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Abstract

Climate migration has emerged as one of the fastest-growing lines of inquiry within migration studies. However, it suffers from a fundamental empirical–conceptual limitation: the absence of a definition that clearly distinguishes a climate migrant from a labour migrant. This research aims to determine how the specialised literature positions the phenomenon, which forms of mobility it recognises and the extent to which the geographical context of scientific production influences its territorial delineation. To this end, the territorial location of migrant populations was analysed in a sample of 1,059 articles drawn from the WoS, Scopus and LENS databases. The results indicate that 39% of the studies treat the phenomenon in a decontextualised manner — without linking it to specific populations or migration processes. When territories are mentioned, 27% of the references pertain to Bangladesh and the Pacific islands. It is also observed that territorial identification is conditioned by the country of production, which tends to situate the phenomenon in spaces with which it has pre-existing migratory, geographical or historical ties. These findings are discussed from the perspectives of Science and Technology Studies (STS), the Geography of Science and decolonial thought. It is concluded that research on climate migration reproduces the epistemological positions of the Global North — the main generator of knowledge in this field. This produces a symbolic territorialisation of the phenomenon guided by securitising frameworks and a tendency to prioritise climate as the decisive factor.

Keywords Migration studies, Climate migration, Geography of science, Epistemology of migration, Bibliometric analysis

Introduction

Since the late twentieth century, climate change has gained increasing prominence in public discourse, ultimately establishing itself as one of the most pressing issues on the international political agenda (Han et al., 2024). In parallel, climate migration—often presented as one of its most significant consequences (Brown, 2008)—has attracted growing interest across media, policy, and especially academic domains (Piguet et al., 2018).

Despite its rising popularity, the concept of climate migration remains the subject of considerable debate within academic circles. The principal criticism concerns the

fragility of its theoretical foundations: after more than three decades of research, there is still no agreed-upon definition that clearly distinguishes climate migrants from other forms of mobility, such as economic migration (Boas et al., 2019; Gemenne, 2011). At the same time, a substantial body of literature has questioned the category, arguing that rather than serving as a robust analytical tool, it functions as a discursive device that reactivates securitised frameworks and postcolonial imaginaries (Baldwin, 2013; Boas et al., 2019; Hartmann, 2010; Narang, 2017). According to Piguet (2018), this discursive configuration also shapes the geography of scientific knowledge by contributing to the territorialisation of the phenomenon in the Global South. These are the regions where the Western imaginary locates poor, vulnerable and potentially displaceable populations, thereby reinforcing stereotypes that cast them as exceptional and threatening.

This conceptual ambiguity—and in light of prior critiques—raises a fundamental question: which territories does the literature designate as "climate migrant" hotspots, and what logic underlies these spatial attributions? To address this question, this study examines the territorial identification of climate migration through a sample of 1,059 academic articles drawn from three major bibliographic databases (Web of Science, Scopus, and Lens). This approach will enable us to identify which regions are most frequently described as prone to climate-induced mobility; determine what types of displacements occur and how they are linked to climate change; and uncover the biases guiding territorial selection. By generating this knowledge, we will contribute to a more reflective science, fostering an approach to climate migration that is both more aware of, and critically engaged with, the reality of the phenomenon.

The situated nature of scientific knowledge

At the end of the twentieth century, through the work of scholars such as Bruno Latour, Sheila Jasanoff and Donna Haraway, Science and Technology Studies (STS) emerged as a critical response to the myth of scientific objectivity. This perspective contributes to demystifying the image of the laboratory as an isolated space and that of the scientist as an impartial observer. On the contrary, the subject who produces knowledge is embedded in specific social contexts, and their work is mediated by cultural, organisational, political, and economic conditions (Latour, 1999). Within this framework, Jasanoff (2004) introduces the concept of co-production, according to which scientific knowledge and social order are co-produced within specific cultural contexts. Complementarily, Haraway develops the notion of situated knowledge to emphasise that there is no neutral gaze: all scientific production stems from a concrete position in the world, shaped by gender, class, culture, and other dimensions of social experience (Haraway, 1988). In line with this idea, the geography of science has highlighted the importance of considering the spatial dimension in the production of knowledge (Livingstone, 2013). This approach underlines that knowledge does not arise in the abstract, but in concrete places, shaped by infrastructures, institutions, and geopolitical relations.

Decolonial thought, for its part, deepens the idea that dominant knowledge is not only geographically situated but also hierarchically distributed on a global scale. From this perspective, hegemonic knowledge is produced in centres of power — primarily in the Global North — where the criteria of validity, scientificity, and relevance are defined. This epistemic asymmetry reflects a persistent global structure in which certain ways of knowing—typically those produced in centres of power—are positioned as universally

valid, while knowledge generated in other cultural, historical, or geographical contexts is often rendered invisible or deemed less legitimate. Thus, knowledge reproduces the perspective of privileged groups who hold the authorised voice within scientific circuits, whereas knowledge from the Global South remains subordinated, marginalised, or outright excluded (Quijano, 2007).

In the field of migration studies, Abdelmalek Sayad (2004) highlights how knowledge about migration is produced from a partial perspective, rooted in the interests of receiving societies. Migration science, as it has been institutionalised, constitutes an academic translation of the worldview of host countries, which tends to fragment the phenomenon into categories such as "emigration" and "immigration", privileging the latter as the central focus of analysis. In this way, the migratory process is constructed according to the concerns of receiving states, which primarily frame it as a problem or a threat to cultural, economic, or social order. This perspective renders invisible the history, voice, and experience of the migrants themselves, reducing them to passive objects of management and control.

Debates in climate migration research

Although there are earlier precedents, such as the work of Ellsworth Huntington, the environmental dimension has historically occupied a marginal position in explanations of migration within the field. The development of the sciences under the criterion of specialisation encouraged a separation between the social and the natural, positioning them as distinct and autonomous spheres. In this context, environmental issues were overshadowed by socioeconomic, political, or cultural factors (Molinero-Gerbeau & Pérez-Segura, 2025). It was not until the late twentieth century that environmental degradation began to be recognised as a relevant factor in population displacement. A turning point came with the report by Essam El-Hinnawi (1985), who, within the framework of UNEP, coined the term *environmental refugee* to draw attention to the potential impact of progressive environmental deterioration on human mobility. He identified the phenomenon in countries of the Global South, where the convergence of poverty, demographic pressure, and ecological degradation would ultimately lead to both internal and cross-border displacement.

Initially, research focused on determinist approaches that attributed to the environment an independent and primary role as a cause of displacement (Piguet et al., 2018). Works by authors such as Jacobson (1988) and Myers (2002) predicted millions of displacements by the beginning of the century, framing the phenomenon as one of the major humanitarian crises of our time. These figures contributed both to raising awareness of the issue and to giving it an alarmist tone. However, not all of the academic community accepted this perspective. Suhrke and Hazarika (1993) conceptualised this tension within the debate by identifying two opposing positions: maximalists and minimalists. The former adopts a mechanistic logic, according to which displacement is an automatic and inevitable response to environmental degradation. In contrast, minimalists reject the idea that the environment functions as an autonomous cause of displacement and argue that mobility results from a constellation of social, economic, and political factors.

Over time, minimalist positions have gained greater recognition than maximalist ones (Cottier et al., 2022). Empirical research has shown that there is no direct or

linear causal relationship between mobility and environmental degradation; short-term impacts have been observed to result in either an increase or a decrease in migration (Daoust & Selby, 2024), while long-term effects are necessarily mediated by contextual factors (Priovashini & Mallick, 2022). The social context plays a decisive role in migration processes, as factors such as in situ adaptation capacity, social structures, and access to credit significantly shape migration decisions (Mukherjee & Fransen, 2024). The complexity of these causal relationships explains why mathematical models are still unable to provide reliable predictions regarding future climate-related mobility (Schewel et al., 2024). Furthermore, the type of mobility associated with ecological crisis contexts is usually not transnational in nature (Clement et al., 2021), which means that figures suggesting massive displacements from the Global South to the North lack solid scientific support (Brown, 2008).

The inability to identify the environment or climate as an independent and primary factor in generating displacement has given rise to significant methodological and conceptual challenges (Gemenne, 2011; Schewel et al., 2024). Although numerous definitions attempt to delineate the phenomenon — for example, by describing it as the movement of people due to the deterioration of their living conditions — these are not analytically operative, as they do not provide a clear criterion for distinguishing between climate-induced migration and labour migration (Boas et al., 2019).

Although this terminological weakness represents a significant theoretical and empirical limitation, it has not led to a decline in scientific production; on the contrary, interest in the topic has continued to grow over the years (Piguet, 2018). Likewise, both within and beyond academia, reductive discourses persist that frame climate migration as a one-dimensional phenomenon with imminent consequences (Wiegel et al., 2019). According to Baldwin (2014), this is because the climate migrant, rather than being an empirically verifiable figure, functions as a symbolic construction that anticipates a future threat. It is an abstraction projected onto specific bodies and territories, based on their presumed vulnerability or lack of adaptive capacity. This representation enables their inclusion within frameworks of risk management, securitisation, and covert racial hierarchies (Baldwin, 2014). This argument aligns with the findings of Piguet et al. (2018) on the geographical distribution of research, which shows that most case studies are concentrated in countries of the Global South — not due to demonstrably higher incidence of the phenomenon, but because of the persistence of postcolonial and security-driven frameworks that portray these territories as sources of instability. In this way, the abstraction of the climate migrant becomes selectively territorialised, reinforcing inequalities in both knowledge production and in the way migration is defined and governed.

Methods

To meet the objective of the research—to identify who climate migrants are—an eminently quantitative analytical strategy has been applied, based on the statistical analysis of bibliometric indicators and key variables from a total of 1,059 scientific articles. All analyses were performed using Python v3.7. The sample of articles was drawn from three scientific databases: LENS, Scopus, and Web of Science (WoS). The selection of these databases was based on criteria of quality, accessibility, and volume of indexed articles. Web of Science and Scopus are two of the main databases used in bibliometric studies,

due to their rigorous indexing process and broad coverage of high-impact journals. Scopus, owned by Elsevier, is notable for its interdisciplinary coverage and advanced metrics, while WoS, managed by Clarivate, is essential for impact analysis through its Journal Citation Reports (JCR). LENS is an open-access platform that integrates scientific publications and patents, containing more than 284 million scientific publications. Most bibliometric studies in this field rely exclusively on Scopus and WoS, but LENS has also been included in this study to broaden the sample coverage. The use of CliMig, a reference database commonly used in bibliometric studies such as Piguet's (2018), was excluded to avoid one-source method bias, i.e., dependence on a single source that could limit the representativeness of the results.

The article selection and retrieval process consisted of different phases. The first step was to select the repositories from which the articles would later be downloaded. Then the search terms were defined by means of a preliminary bibliographic review (Fig. 1). Once the search criteria were established, we proceeded with the article search, which concluded on 3/17/2022. Therefore, the research has no work after that date. A total of 7,282 articles were retrieved during the search phase. These were reviewed one by one through their abstracts to check their thematic linkage and rule out duplicate papers. This review served as a preliminary content analysis of the papers in the sample. The filtering process was concluded with a total of 1,059 valid articles.

During the article retrieval process, measures such as year of publication, number of citations and authors' names were collected. However, in order to meet the research objectives, it was necessary to add additional information to the original database. Information on the country's wealth was included through the GDP per capita variable, obtained from the World Bank database. In addition, it was also necessary to construct a set of variables from the information in the articles. These variables and the criteria used for their construction are presented below.

Country of author affiliation The objective of this variable is to identify the country where the research originates. Many studies are transnational in nature, involving authors affiliated with institutions in different countries, and some authors may have multiple affiliations across more than one country. To ensure that each article is assigned a single country of origin, only the primary affiliation of the first author has been considered. In cases where the first author had multiple affiliations, the main affiliation was selected. Affiliation data was retrieved through an internet search using the article's DOI or title. This variable necessarily entails limitations because it reduces multiple authorship locations to a single country of origin. Publications may simultaneously reflect contributions from different countries, corresponding to the various affiliations of all co-authors. Although we recognise this limitation, we deem it acceptable because the first author typically assumes a leading or principal role in the research design.

Geographical identification of climate migrants The objective of this variable is to identify the country that, in each study, is mentioned as a climate migration hotspot. This includes not only countries analyzed in empirical case studies but also those presented—

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( "climate" OR "environmental" ) AND ( "migrant" OR "displacement" OR "refugee" )
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Fig. 1 Query for research article retrieval

even as examples— as climate migration hotspots or potential hotspots. To streamline the data extraction process, only locations mentioned in titles and abstracts were considered. This means that some references to specific populations within the main body of the manuscript may not have been captured in this study. The data collection process was conducted through a pseudo-automated approach in two phases. First, a Named Entity Recognition (NER) model was applied, a tool that allows words in a text to be tagged into different categories, such as Person, Location, and Language. This helped identify articles that contained a location in the title or abstract. In the second phase, a manual review was conducted to correct classification errors and identify additional locations that were not detected by the automated model. In cases where multiple locations were mentioned, all were included in the variable, meaning that a single study can identify climate migration in multiple territories.

Identified destinations of climate migrants This variable records the countries identified in the research as current or potential destinations for transnational climate migration. The data collection process followed the two-phase methodology described in the explanation of the variable Geographical Identification of Climate Migrants. As in the previous case, only destinations mentioned in the title and abstract were recorded. Similarly, as many destinations as were mentioned in these sections were collected, which could range from none to several.

Results

Who are climate migrants?

To answer the guiding question of "Where are the climate migrants?", a systematic review of 1,059 academic studies was carried out to identify which territories or populations have been identified in the literature as migrants or potential climate migrants.

40% of the reviewed works address climate migration in abstract terms, without focusing on any specific population or territory. On the other hand, 60% of the sample does mention specific populations as emitters or potential emitters of climate migration. In total, 76 countries have been identified as potential sources of climate migration (Fig. 2). However, the frequency with which these countries are mentioned is notably unequal with the majority of mentions being concentrated in a few territories.

Next, the distribution of the papers by continent will be analyzed, and the main patterns of climatic mobility in each region will be described according to the findings of the literature.

Asia

Asia is the most referenced region in the climate migration literature. Within Asia, 19 countries are identified as foci, with a particular emphasis on South and Southeast Asia. Although there are also studies on East Asia, mainly China, and the Middle East, with a focus on Syria.

Bangladesh is the most studied country in terms of climate migration, both in Asia and globally, appearing in 15% of papers that mention a specific territory. Its high vulnerability is due to multiple critical factors: high population density, high levels of poverty and a rural economy dependent on agriculture. In addition, its location in the largest river delta on the planet exposes it to flooding, bank erosion and soil salinization due

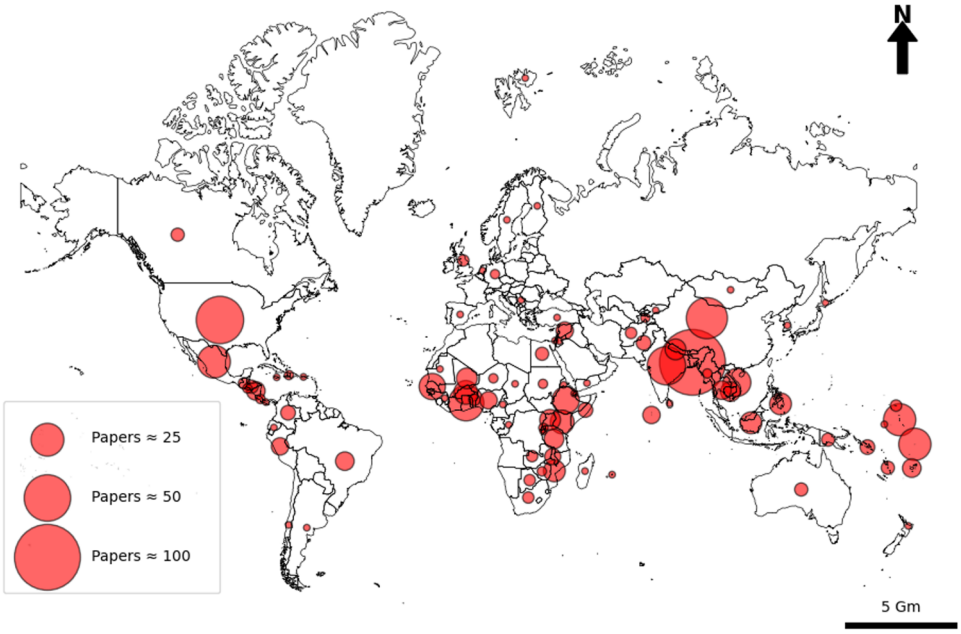

Fig. 2 Frequency of mentions of territories as foci of climate migration. The map shows the geographical distribution of climate migrants based on research findings. Bubble size is proportional to the number of studies mentioning each territory. Studies citing multiple locations are counted separately for each

to cyclones and torrential rains. Despite these risks, migration is neither an immediate nor a widespread response (Ahsan et al., 2022). Mobility is often a last resort when ecological collapse and agricultural precariousness become unsustainable (Penning-Rowsell et al., 2013). When it occurs, it is mostly internal (Mukaddim & Hossain, 2021), with a rural exodus from the southeast to the northwest of the country and often taking a temporary form (Call et al., 2017). Far from always being an adaptive strategy, this displacement sometimes entails a loss of status, which reinforces the communities' resistance to migration (Nayna Schwerdtle et al., 2021).

In Southeast Asian countries such as Vietnam, Indonesia, the Philippines, and Cambodia, migration shares common elements with that of Bangladesh, given that they present similar socio-environmental contexts. This type of mobility is primarily internal, rural-urban, and economically driven; it is often temporary, not an automatic response, and can be detrimental (Burrows et al., 2021; Chandra et al., 2017; Jacobson et al., 2019; Thiede & Gray, 2017). In India, although the environmental context is different, similarities are also observed: migration tends to be for economic reasons internal, rural-rural or rural-urban, and temporal (Dallmann & Millock, 2017; Jha et al., 2017; Pradhan & Narayanan, 2022; Sedova & Kalkuhl, 2020).

On the other hand, China, the third most mentioned country, presents a different scenario from the rest of Asia. The migration studied is not only due to climatic factors, but also to environmental quality, air pollution (Hu et al., 2022) and the degradation of natural resources (Rodenbiker, 2020). Many studies analyze the impact of ecological relocation programs promoted by the government to reduce environmental pressure in certain regions (Rodenbiker, 2020). However, these initiatives have generated new conflicts, such as the uprooting of communities and the lack of job opportunities in the new environments (Xu et al., 2022).

Africa

Africa is the second continent with the most studies on climate migration, with about half of its countries mentioned in the literature. However, as in Asia, most of the research is concentrated in a few territories, especially in the eastern and western regions, which account for 91% of the studies. Within these, Ghana and Ethiopia stand out as the most analyzed countries.

Environmental mobility in Africa is not homogeneous; there is a great diversity of migration processes depending on the country. However, common patterns can be identified. Most studies focus on rural areas, where agriculture and livestock-based livelihoods are affected by environmental degradation and droughts, as well as limited and unequal access to land (Antwi-Agyei et al., 2015), lack of adequate infrastructure, and restrictions in access to credit and finance (Kumasi et al., 2019).

As a consequence of these pressures, migration processes are generated, mainly internal, towards environments with more fertile land and greater economic opportunities. However, migration is not an automatic response to climatic interference—sometimes even discouraging it (Hermans & Garbe, 2019; Mueller et al., 2020)—but is subject to various factors, such as gender (Mensah et al., 2022), the availability of economic resources (Hirvonen, 2016) or the migration history of the family (Groth et al., 2020).

In many cases, communities develop strategies to cope with climate change without displacement, either through livelihood diversification or through adaptive agricultural practices (Laube et al., 2012). However, when migration occurs, it does not always result in improved living conditions, as migrants may face new forms of vulnerability at their destinations (Antwi-Agyei et al., 2018).

Oceania

The study of migration in the Oceanic region focuses predominantly on the so-called Small Island Developing States (SIDS). These territories are often treated as a homogeneous group, which obscures significant differences between them. The Pacific Islands are the second most frequently referenced region in the literature, appearing in 12% of works that mention any territory.

The main reason why climate migration is associated with these territories is the potential threat posed by rising sea levels, given their low altitude relief. This context has positioned them in the global imagination as being on the frontline of climate migration. However, there is currently no empirical evidence that climate change impacts are leading to large-scale displacements (Noy, 2017). In practice, the possibilities for migration are severely constrained by significant legal, economic and social barriers (Constable, 2017). Those most exposed to climate risks often lack the resources and capacity to migrate, which deepens existing inequalities in how communities can respond to climate impacts (Taupo et al., 2018).

Beyond material limitations, strong cultural and legal ties to the land, often linked to customary or collective ownership, discourage permanent migration, as leaving would mean breaking bonds with community, identity and territorial rights (Constable, 2017; Oakes, 2019). For this reason, many island communities choose to remain and advocate for their needs internationally, rather than resorting to migration as a solution (Noy, 2017). Even when migration occurs, it does not always lead to better living conditions. In some cases, such as Tuvaluans moving to New Zealand, migration has proven to be

maladaptive, resulting in challenges related to health, livelihoods and social integration, rather than the anticipated improvements in quality of life (Emont et al., 2021).

America

Research on climate mobility in the Americas has focused disproportionately on the United States, where two main approaches predominate: (1) prospective studies on the impact of climate change on population redistribution and (2) the analysis of the mobility of populations vulnerable to natural disasters. Studies on vulnerable communities have focused primarily on the Alaskan population and those affected by hurricanes, especially Katrina and Irma. In the Arctic, melting ice and coastal erosion have not led to mass migrations due to economic, cultural, and social barriers (Hamilton et al., 2016). Similarly, in the context of natural disasters, mobility depends on available resources: while some may move to safe areas, marginalized communities, without viable relocation options, are trapped in high-risk areas (Elliott, 2015).

The second most studied country on the continent is Mexico. The literature on climate migration in this country has focused on analyzing how climate change, especially through droughts and variations in agricultural yields, influences international migration to the United States (Hunter et al., 2013; Nawrotzki & DeWaard, 2016). Although some South American countries have been studied, the volume of publications is considerably lower. Brazil and Nicaragua stand out as the most researched in the region.

Europe

Research on climate-related mobility in Europe remains limited, with only eight studies examining various aspects of the relationship between climate and migration. Of these, only one study examines international migration within the European population, projecting that the economic impacts of global warming could incentivise movements from southern to northern Europe (Aaheim et al., 2012). In the UK, a study on internal migration concludes that climate change will exert only a minor influence on patterns of population redistribution (Fielding, 2011). Similarly, research on the indigenous Saami population indicates that although climate change impacts their livelihoods, it does not necessarily lead to displacement (Kelman & Naess, 2019).

The remaining studies address diverse topics, including lifestyle migration from Germany and the Netherlands to Scandinavia (Persson, 2019); historical analyses of climate-related mobility in Germany (Glaser et al., 2017) and the Netherlands (Jennings & Gray, 2015); displacement management in Serbia (Crnčević & Lovren, 2017); the impacts of green gentrification in urban areas (Triguero-Mas et al., 2021); and a comparative study of climate change risk perceptions in Spain and Australia, which suggests that climate change may influence the relocation of coastal populations in both regions (Fatorić et al., 2017).

Where do they go?

In addition to identifying climate migrants, we sought to determine the main destinations of transnational climate migration (Fig. 3). In the sample, few papers mention a specific destination for these movements. However, most of the destinations identified (70%) are concentrated in a small number of countries: New Zealand, the United States and Australia. These migratory routes coincide with conventional migratory flows, such

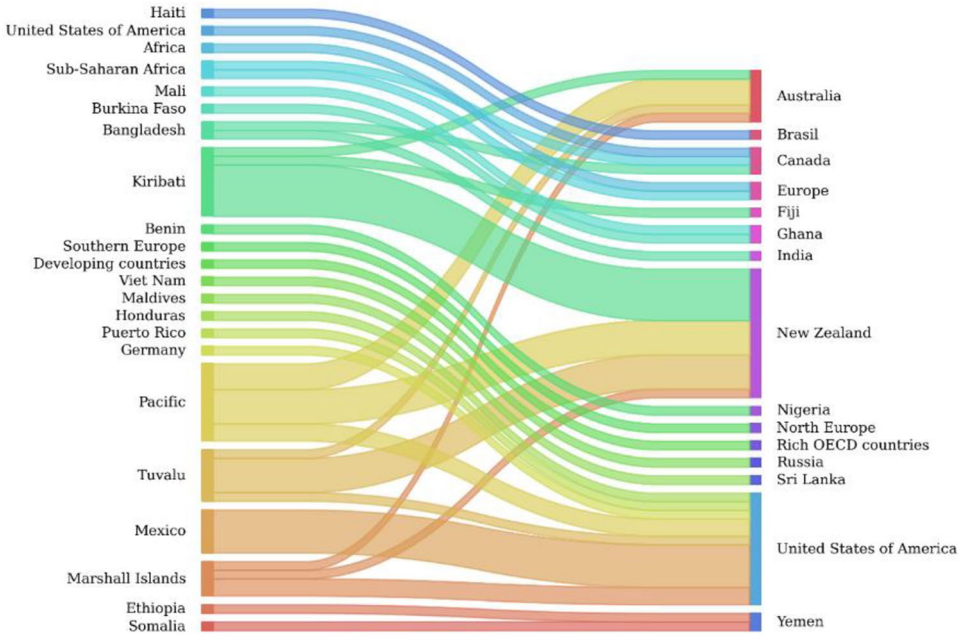

Fig. 3 Relationship Between Climate Migrants' Countries of Origin and Their Transnational Destinations in Scientific Research. This Sankey diagram shows the frequency and connections between climate migrants' origins and transnational destinations in scientific research. Flow width reflects the relative number of studies citing each migration route

as migration from Mexico to the United States or from the Pacific Islands to Australia and New Zealand.

Migratory routes within the global south have also been identified, although to a lesser extent. In these cases, the same pattern is observed: the destinations correspond to countries that already receive regular migration from the same places of origin. Examples are migration from Bangladesh to India, from Haiti to Brazil or from Burkina Faso and Mali to Ghana.

Who shapes climate migration research?

In total, articles produced by academic institutions from 69 different countries were identified (Fig. 4). However, scientific production shows a marked inequality between countries. The wealthiest countries are the most prolific in climate mobility research, as evidenced by a moderate correlation between GDP per capita and the number of publications (Spearman's $r = 0.49$; $p < 0.001$). Despite the predominance of the Global North, some countries of the Global South have a notable presence in scientific production. India (2.6%) and Bangladesh (2.2%) equal or even surpass countries with stronger economies, such as France (2.2%) or Switzerland (2%). Disparities in academic output between the Global North and the South are not only reflected in the number of publications, but also in their impact. There is a moderate correlation between the h-index of publications and the wealth of the country (Spearman's $r = 0.517$; $p < 0.001$), suggesting that the influence of a study on the literature is related to the economic capacity of the country in which it is produced.

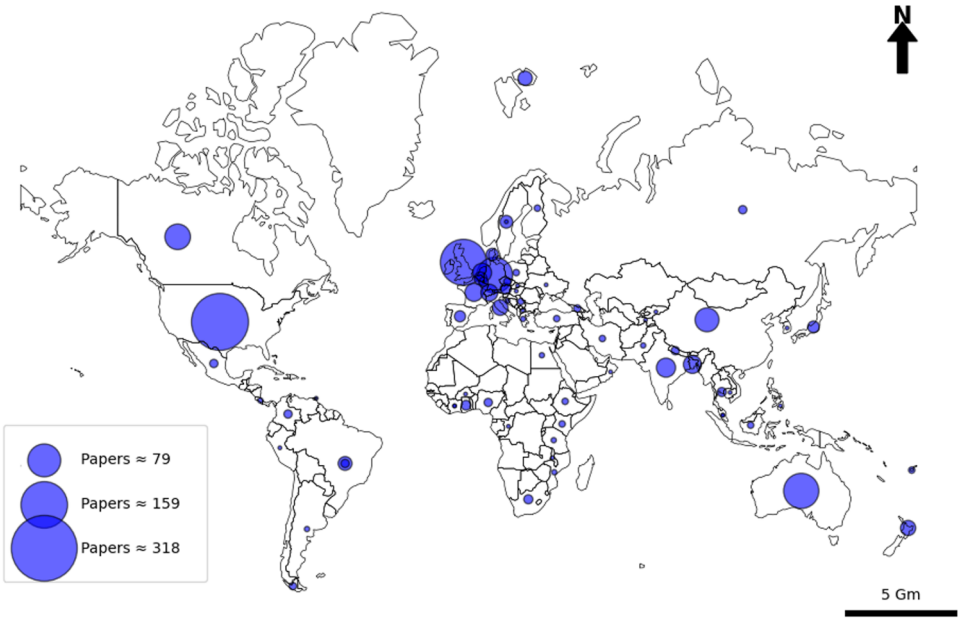

Fig. 4 Global Distribution of Scientific Publications on Climate Migration. The map shows the distribution of scientific publications on climate migration by country. Bubble size is proportional to the number of academic papers produced, with larger bubbles indicating more publications

Geography of climate migration research

Finally, to examine the underlying logics shaping the territorial identification of migration in knowledge production, the relationship between the origin of the research and the territories studied was analysed (Fig. 5). The first key finding reveals a general pattern of self-research, with most countries prioritising the study of migration within their own borders. However, there are notable exceptions: European countries, for example, tend to focus their research on distant regions, particularly in Asia, Oceania, and Africa. Likewise, research priorities often align with countries that have some form of connection to the territories under study. These links can result from three main factors: (1) geographical proximity, as seen in research conducted within Africa and Asia; (2) established migratory flows, such as those between the United States and Mexico, India and Bangladesh, or Australia and New Zealand and the Pacific Islands; and (3) historical ties, reflected in the focus of the United Kingdom and Germany on countries that were formerly their colonies, including India, Bangladesh, and Ghana.

Additionally, two territories of universal interest were identified: Bangladesh and the Pacific, which are the subject of extensive research conducted by countries from across all continents. This widespread focus suggests that certain regions have acquired a paradigmatic status in climate migration studies, serving as emblematic cases through which broader narratives about environmental displacement are constructed.

Discussion

Territorialización simbólica del fenómeno

This study builds upon the work of Piguet (2018), which stands as a key reference in the geographical analysis of scientific production on climate migration. However, our study differs from his both in terms of sample design and analytical approach. Regarding the sample design, three main differences are introduced: (1) the articles are collected

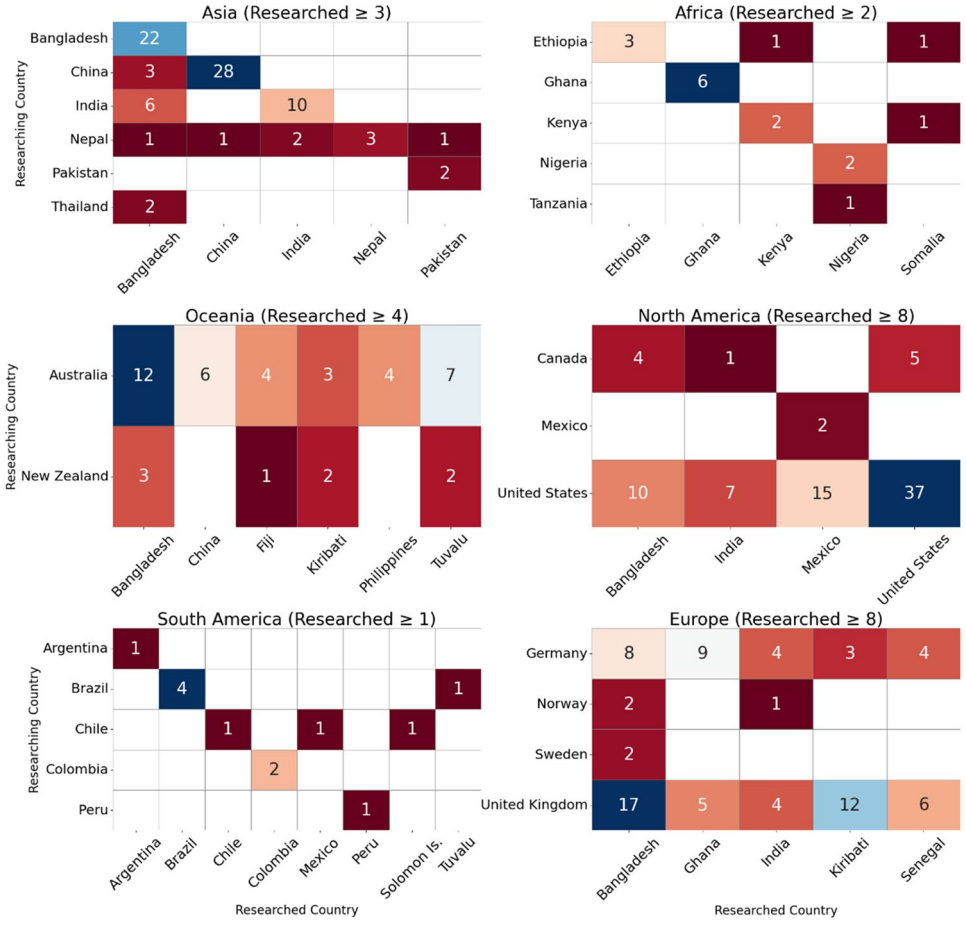

Fig. 5 Studies Conducted by Each Country on Specific Target Countries. The heatmap shows the number of climate migration studies by country and their research focus. Rows represent researching countries, while columns indicate the studied countries. Only countries that meet the 'researched ≥ X' threshold are displayed, meaning those with fewer studies are excluded to enhance data visualization

from various bibliographic sources — Lens, Scopus, and Web of Science — in contrast to Piguet, who relies on the Climig database; (2) our dataset extends the period covered by Piguet by an additional four years; and (3) whereas Piguet focuses solely on case studies, we include all academic research addressing the phenomenon, regardless of its empirical approach. This decision allows us not only to identify the territories in which the phenomenon is situated — even when it is not the direct object of study — but also to analyse the extent to which it is linked to specific populations and migration projects.

At the analytical level, unlike Piguet (2018), whose approach is limited to a cartographic analysis of the origin and destination of science (i.e., the research centres and the territories studied), our study explores the relationships between these two spaces in greater depth. Consequently, our work not only updates and contrasts his findings — using a different sample that reduces potential biases associated with the data source— but also advances towards a more refined analytical approach, enabling a deeper exploration of the underlying dynamics that shape scientific practices in the territorial identification of the phenomenon.

The first significant finding regarding the territorial identification of the phenomenon is that 40% of the articles analysed do not mention any specific territory or migratory

process in their abstracts. Although in some cases the body of the text refers to particular populations, the absence of explicit references to populations or territories in the abstracts suggests that the dominant approach tends to present climate migration as an abstract phenomenon, detached from empirical contexts. This pattern reinforces Baldwin's (2013) thesis, according to which the climate migrant is configured as a virtual subject: a discursive figure that does not refer to people in motion, but rather condenses a horizon of future possibilities shaped by fears, risks, and projections.

In the 60% of studies that do link the phenomenon to specific populations, a geographical distribution can be observed that aligns with the pattern identified by Piguet (2018): most research originates in countries of the Global North, while territories in the Global South are most frequently represented as sites — or potential sites — of migration. However, the analysis of the territorial identification of the phenomenon by country has made it possible to reassess Piguet's (2018) hypotheses in light of new evidence. Specifically, three main dynamics have been identified: (1) domestic localization of the phenomenon, shaped by a self-perception of vulnerability; (2) a focus on territories with which prior links exist; and (3) attention to territories considered to be of international interest.

Although Piguet (2018) downplays the role of self-investigation in the geographical distribution of case studies, our findings indicate that this practice is widespread at the international level. However, certain countries (such as Australia, New Zealand, Canada and several European states) deviate from the general pattern: they tend to locate the phenomenon almost exclusively in Global South contexts. Even when addressing it within their own borders, they situate it in impoverished populations or ethnic minorities, shifting the focus to the social, symbolic or geographic margins of the nation. This pattern is also evident in China and the United States, although in these cases, substantial domestic research activity has positioned them among the most studied countries.

In the Global South, by contrast, the countries that contribute most to research on the phenomenon often coincide with those most studied by the North, suggesting a territorial correspondence in the identification of the issue. Nevertheless, the volume and visibility of this output remain significantly lower. Additionally, there is a general tendency to locate the phenomenon in territories with which certain links exist (whether through geographical proximity, migratory ties or historical connections), suggesting that how knowledge is produced influences the territorial identification of the phenomenon. The systematic focus on such territories (particularly those linked by real or imagined migratory flows) reveals a geography of knowledge shaped by securitisation frameworks and a technocratic approach oriented towards border prevention (Boas et al., 2019; Hartmann, 2010). This logic projects scenarios of risk onto impoverished regions, reinforcing their portrayal as spaces of threat and destabilisation (Bettini, 2013). Thus, far from responding solely to scientific criteria, research priorities align with a strategic rationality tied to national and control-oriented interests (Boas et al., 2019). This aligns with recent work highlighting how climate mobility research and policymaking themselves contribute to bordering processes, defining who is seen as vulnerable, threatening, or in need of protection (Boas et al., 2024).

A third trend identified is the disproportionate concentration of studies in certain territories of international interest (such as Bangladesh, the Pacific Islands or the Sahel), which have become consolidated in the transnational imaginary as paradigmatic spaces

of climate migration. However, an analysis of mobility patterns in these contexts challenges the dominant reductionist view: migration rarely occurs as a direct response to climate change but is mediated by sociocultural and structural factors (Mukherjee & Fransen, 2024). In many cases, rather than improving living conditions, these forms of mobility may be maladaptive and exacerbate vulnerability (Han et al., 2024). As Dewan (2023) argues, in contexts such as Bangladesh (where mobility is a longstanding practice), attributing such displacements solely to climate change constitutes a false environmental causality that depoliticises the phenomenon and obscures underlying structural processes such as induced degradation, the expansion of aquaculture, or rural abandonment.

The politics of knowledge and the geography of climate migration

Among the hypotheses proposed by Piguet (2018) to explain the geographical distribution of research on climate migration is that of pragmatic factors, which attributes the asymmetry in research production to material conditions such as accessibility, political stability, or scientific infrastructure. While Piguet considers this a secondary factor, from a perspective informed by science and technology studies, we argue that this material dimension plays a more significant role.

Climate change is currently a priority on both political and scientific agendas, and climate migration is presented in the collective imagination as one of its most urgent impacts (Brown, 2008). Since then, the phenomenon has consolidated itself as an attractive academic niche (Han et al., 2024). This has encouraged the involvement of researchers from outside the migration field, as well as an interest in reinforcing the centrality of climate change as an explanatory cause, in the pursuit of greater visibility, impact, and funding. All of this helps to explain not only the persistence of the category despite its conceptual limitations, but also the reproduction of a markedly reductionist discourse.

Within this framework, the effort to validate the category has steered research towards a limited number of territories, which disproportionately concentrate the majority of studies. As Farbotko (2010) argues, Tuvalu has been represented as a setting in which to crystallise the statistical abstractions of climate change, and its inhabitants as "desirable victims" whose disappearance would confirm the urgency of the global crisis. Dewan (2023), for his part, documents how some researchers admit to deliberately incorporating the label of "climate migration" into their studies in order to access international funding, despite knowing that the main causes of displacement were linked to agro-industrial extractive practices rather than to climate change.

Thus, the analysis of scientific practices concerning the territorial identification of the phenomenon reveals the situated nature of knowledge, which is constructed within frameworks specific to the Global North, where the majority of research is produced. In turn, countries in the Global South tend to internalise the discourse from the Global North, which portrays them as risk zones or vulnerable territories. This dynamic entails a form of symbolic violence (Bourdieu & Passeron, 1990), rooted in the dominance exercised by the North over the production, representation, and circulation of knowledge. At the same time, it can also involve *strategic labelling*: the instrumental adoption of categories such as "climate migrant" to gain access to resources and recognition within the international cooperation regime. As Dewan (2023) has noted in the case of Bangladesh,

in economies highly dependent on international aid, climate change becomes a useful category for maximising eligibility for development funds and projects.

Conclusion

The geographical analysis of 1,059 articles has made it possible to answer the central question guiding this research: where are climate migrants? Most of the literature reviewed constructs the figure of the climate migrant as an abstract subject, detached from specific territorial or population contexts, and associated with a reductionist approach that simplifies the causes and dynamics of the phenomenon. When linked to concrete populations, these tend to be located in territories from which migration is received—or perceived as potentially being received—as well as in those spaces that have become established as paradigmatic examples of climate migration, such as Bangladesh or the Pacific Islands. However, analyses of mobility types and displacement causes reveal a far more complex reality, in which climate rarely acts as the ultimate cause. This dissonance between dominant discursive frameworks and empirical evidence can be explained by the centrality of climate change in the global political and scientific agenda, which has turned climate migration into an attractive research niche. This has driven an accelerated academic output, more invested in maintaining the centrality of climate as an explanatory cause—guided by the logic of publishability, impact, and access to funding—than in empirical fidelity to the phenomenon.

Acknowledging the situated nature of scientific production does not invalidate the knowledge generated thus far. On the contrary, the literature on climate migration has made a valuable empirical contribution by exploring the relationship between environment and mobility, thereby helping to address a historical gap within migration studies. Nonetheless, recognising the inherent limitations of current scientific practices is essential for advancing towards more reflexive and robust research. Future studies should aim to construct honest knowledge: on the one hand, by acknowledging the multicausal nature of the phenomenon—thus moving beyond deterministic frameworks—and on the other, by shifting the focus away from control and migration management towards forms of knowledge that are relevant and useful to affected populations.

Author contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Víctor Pérez-Segura. The first draft of the manuscript was written by Víctor Pérez-Segura and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data availability

The data are available in case they are requested by the reviewers, as well as they will be made public in a GitHub repository if the work is accepted.

Declarations

Competing interests

This study was conducted independently, and the authors declare no competing interests that could have influenced the research, analysis, or conclusions presented herein.

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