

The Demographic Perspective on the Environment-Migration Nexus: A Systematic Literature Review

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Introduction

Climate change has become a major concern for the international community and the link between environmental hazards and human migration has gained attention over the past decades from academics, media and in public debate. IOM defines environmental migration as the “movement of persons or groups of persons who, predominantly for reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are forced to leave their places of habitual residence, or choose to do so, either temporarily or permanently, and who move within or outside their country of origin or habitual residence” (IOM, 2021).

Environmental migration is a complex phenomenon that intersects with multiple disciplines, including demography, environmental science, economics, and sociology. The scientific literature on internal and international migration as a permanent or temporary response to environmental changes is growing notably in terms of number of country-level studies and comparative meta-analysis, providing contrasting evidence (Cipollina et al. 2024; Hoffmann et al., 2020; Beine & Jeusette, 2019; Beine & Parsons, 2017; Obokata et al., 2014; Gill, 2010; Bates, 2002). The research focus spans on direct or indirect effects of gradual environmental changes, rapid-onset events, highly vulnerable areas, and human-induced environmental degradation. Most studies find that environmental hazards affect migration, although with contextual variation (Hoffmann et al., 2020). Environmental drivers of migration have been found to be tightly intertwined with other social, economic, and political factors such as gender, income, urbanization, conflict, colonial ties (Fenz et al. 2024; Hoffmann et al., 2020; Borderon et al. 2019; Beine & Parsons, 2017; Obokata et al. 2014). Migration is one of many coping or adaptive strategies to adverse climate and other environmental developments (Beine & Parsons, 2017); it predominantly occurs in non-OECD countries (Borderon et al. 2019), within the same country (Hoffmann et al., 2020) or toward neighbouring countries (Beine & Parsons, 2017); it is more relevant for households or communities that rely on natural resources for their livelihoods, depending also on individual socio-demographic characteristics such as age, gender, and economic status (Borderon et al. 2019; Abel et al., 2019); and it is expected to intensify in the future as climate change worsens over time (Muttarak, 2021; Beine & Jeusette, 2019).

Aim of the study

Demography plays a crucial role in understanding the environment-migration nexus as it represents a privileged perspective for investigating how population changes interact with environmental issues, resources' availability and mitigation strategies (Adamo, 2024; Merchant & Grace, 2024; Muttarak, 2021). One of the main branches of Demography investigates and predicts migration patterns as a one of the three components of population change (with fertility and mortality) and the relationships between migration and other underlying demographic factors, such as population growth rates and density, urbanization, age structure, socio-economic characteristics and vulnerabilities, policy strategies, implementations and outcomes. Moreover, environmental migration may have substantial demographic consequences, including changes in population distribution, age structure, and social dynamics. Yet, to our knowledge, the demographic perspective on the topic drowns within the ever-growing scientific production and theoretical paradigms. By systematically reviewing and synthesizing the literature, researchers can gain insights into current trends, findings, and gaps in demographic studies, identifying areas where further investigation is needed (Pisarevskaya et al., 2020; Aria &

Cuccurullo, 2017). The aim of this paper is to provide a comprehensive overview of the demographic literature on environmental migration, mapping the demographic knowledge's advancements in the field, the seminal contributions, the contexts, the data sources and the analytical techniques that have so far been the subject of empirical research. The content analysis reveals the existence of topic clusters in the corpus of papers, the drivers of environmental migration under study and their interactions with non-environmental factors.

Data and Methods

Adopting a structured SAAS workflow (Search, Appraisal, Analysis and Synthesis), a qualitative exploration of systematic reviews and meta-analysis on the environment-migration nexus has been initially conducted. The scope is defining the inclusion criteria and supporting the design of a query of keyword combinations and Boolean operators able to capture a broad yet relevant set of results for building the publications' dataset. We use the Clarivate Web of Science (WoS) document search service to retrieve scientific publications on the topic. We collect titles, abstracts, keywords and metadata for 3,294 scientific products published between 1986 and 2024 providing the abstract in English. No restrictions were applied regarding language, publication date, or publication status.

We analyse publications' metadata such as journals' information, publication year, country of affiliation of first author and number of citations. We analyse the content of titles, abstracts and keywords using the TF-IDF method (Term- Frequency and Inverse Document Frequency) and Latent Dirichlet modelling for topic clustering. We perform our analysis using the R package *bibliometrix* and its user interface *biblioshiny*, developed by Aria and Cuccurullo (Aria & Cuccurullo, 2017).

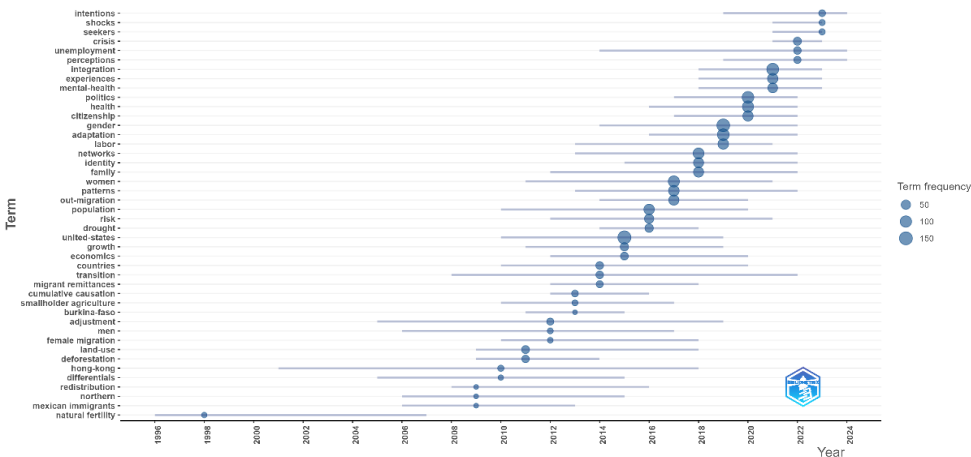
Preliminary results

Our preliminary results provide some descriptive statistics of the dataset and some primary findings on the contents' clustering. We collect 3,294 scientific papers published between 1986 and 2023 by 225 specialized demographic journals involving 5,398 scholars from research institutes worldwide, with an annual growth rate of 12.2%, relative peaks of production in the years 2006, 2016 and 2021 and a rate of international co-authorship of 22.5%. The most relevant sources in the dataset are the Journal of Ethnic and Migration Study (394 papers), International Migration (345 papers) and Population Space and Place (194 papers). An analysis of the affiliation country of first authors reveals that, similarly to other migration-related areas of publications (Pisarevskaya et al., 2020), the topic has gained attention over the years mainly in traditional receiving countries, such as United States, United Kingdom, Canada and Australia. Looking at publications' metadata, we find that papers have received on average slightly more than 17 citations per-paper, with an absolute peak of citations for papers published in the year 2005. The core journals with highest impact (Bradford's Law) in our collections are the Journal of Ethnic and Migration Study (2,948 citations), International Migration Review (2,826) and Demography (1,498).

At first glance, the analysis of most frequent words in the whole period (Figure 1) reveals the tight intersection between environmental migration and other social, economic, and political migration-related factors, deduced from the highest frequency of words like gender, family, labour, health, networks, identity. The large use of words such as assimilation, integration, citizenship highlights the dominance of receiving countries' perspectives in a an emergencial approach of massive migration (shock, crisis, asylum seekers, integration). The temporal distribution of most frequent words reveals that the main focus has shifted from the Malthusian idea of limited natural resources (natural fertility, land use, deforestation, drought, smallholder agriculture), fitting in a common paradigm or economic migrations (redistribution, differentials, remittances, economics, labour, unemployment) (Pisarevskaya, 2021), to a more individual-centred approach (intentions, perceptions, experiences), highlighting the role of psychosocial factors (health, mental- health, gender, identity). More recent

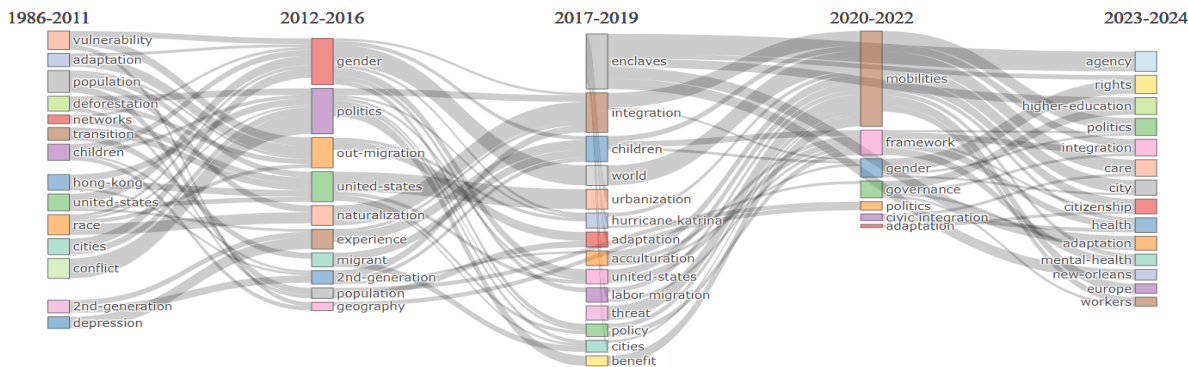
paradigms in migration theoretical development can be identified in the frequency of words like networks, cumulative causation, adaptation.

Figure 1: Trend topics given by most frequent words by year, 1986-2024



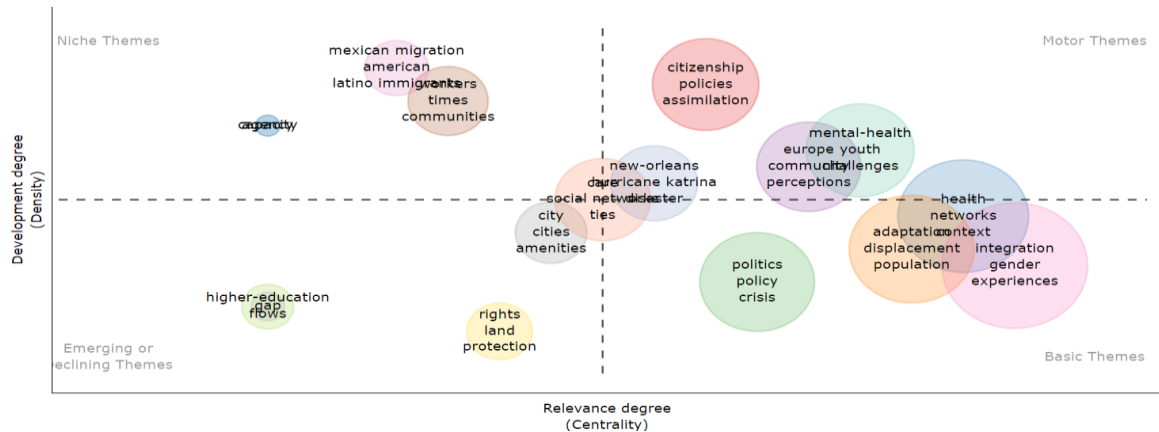
Source: Elaborations on WoS data with *biblioshiny* (Aria & Cuccurullo, 2017)

Figure 2: Thematic evolution over the years 1986-2024



Source: Elaborations on WoS data with *biblioshiny* (Aria & Cuccurullo, 2017)
Note: Cutting points have been identified by the model on the base of number of publications

Figure 3: Thematic evolution, time slice 2020-2024



Source: Elaborations on WoS data with *biblioshiny* (Aria & Cuccurullo, 2017)

Looking at the thematic evolution of literature (Figures 2), the temporal cutting points identified by the model reflect the uneven distribution of publications in the reference period. Some topics gain importance over the different timeframes, highlighting a growing attention to vulnerable groups increasingly involved in migration (children, women), to a policy-oriented factors affecting migration and the response to environmental hazards (politics, rights, asylum, education) or to specific impacting events (Hurricane Katrina, New Orleans, Hong Kong). In Figure 3 these emerging topics are highlighted by their position in terms of centrality and density across the literature (higher education, rights, protection, land rights, amenities) and prompt the need for further analysis on the role of social and political inequalities in human mobility.

Additional results will be ready for IPC 2025.

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