Climate Migrants in Urban Heat Islands: A Qualitative Study of Delhi and Karachi

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Abstract

Introduction

Research related to climate migration has been dominated by quantitative studies however qualitative work is scarce. This research examines academic articles, personal narratives, and lived experiences of climate migrants related to Urban Heat Islands (UHI), urban inequality the health impacts associated with forced migration, with a focus on Delhi and Karachi.

Methodology

A qualitative comparative secondary research design by synthesizing existing data from academic, and supporting it via authentic published reports, media coverage, and official websites. Qualitative data were analyzed using thematic analysis following Braun and Clarke's six-phase approach. As the data consists of secondary research and publically available narratives and no primary data was incorporated to avoid confidentiality issues, authentic published reports, media coverage, and official websites.

Results

The results of thematic analysis revealed four themes namely "Lack of Residency," "Water Scarcity," "Gendered Vulnerabilities," and "Health Concerns." A comparative analysis of Delhi and Karachi showed that although certain government policies and legislations exist in Delhi, the condition of climate migrants remains quite similar to that in Karachi. Climate migrants of both cities face similar issues of uninformed eviction and demolition of homes, water mafias and scams, women harassments, and severe mental, physical and emotional stresses.

Conclusion

Since many people from rural areas in India and Pakistan migrate to Delhi and Karachi respectively due to severe climatic conditions, they are forced to live in informal settlements, which are often demolished without notice or rehabilitation causing serious issues. This study is the first to highlight the serious need to take steps for the betterment of climate migrants in both Delhi and Karachi.

Keywords: Climate Impact; Climate Migration; Heat Stress; Urban Heat Islands; Health Impacts; Policy

1. Introduction

South Asians make up 15% of all urban dwellers worldwide. Due to the pervasive degradation in these cities, they are susceptible to the effects of climate change phenomena, such as the urban heat island (UHI) effect, which is a temperature differential between urban and rural areas (Kotharkar et al., 2018). Urbanization is the population increase in urban regions; it encompasses all institutional, biophysical, social, and economic changes brought about by and associated with urban growth, many of which have a significant impact on people's well-being. Urban growth is currently fastest in the Global South. Since 2015, the global South has been home to more than 75% of the world's urban population (Smit, 2021). Although migration to urban regions is a major factor, the majority of this urbanization is due to urban areas' higher natural population growth rates than rural ones. There are several general common trends, despite the fact that urbanization processes contrast among the global South's homelands (Randolph & Storper, 2023). These include a sharp rise in the number of urban residents, persistently strong urban–rural ties and a growing blurring of the lines between "urban" and "rural," increased urban sprawl and fragmentation, and widening intra-urban disparities (Aslam et al., 2025; Kamal, 2022).

The global South's urbanization processes have added to the burden of disease's increase and complexity. Due to unfavorable environmental circumstances in many areas of cities, especially in informal settlements and other slums, infectious illnesses have persisted at high levels. In the global South, non-communicable diseases are also rising quickly due to changes in living conditions and lifestyle brought on by urbanization (Dorsey, 2025). Increased reproductive and respiratory illnesses brought on by rising levels of violence brought on by widespread poverty and gender inequality, rising obesity rates due to altered lifestyles brought on by urbanization, an increase in unsafe settlements in dangerous areas, and a high risk of infectious diseases are all reasons why it is predicted that the burden of disease in cities in the global South will continue to rise as urbanization continues. These threats are probably going to get worse due to climate change (Duminy, 2023). The interaction between local UHI and global climate change is posing challenges to human health, development, and well-being. Reducing urban overheating is becoming increasingly crucial because most people in the twenty-first century live in cities (Gupta, 2024; Sharma et al., 2024).

Important mitigating methods, have been developed this century. In order to combat urban heat under a range of climatic conditions, a variety of mitigation strategies are needed (Ramos & Uitermark, 2025; Snijders, 2023). The complicated relationship between ecological changes and socio-economic factors forces people to migrate as a strategy for adaptation (Chen & Goutte, 2025). There are pros and cons to migration and the resulting urbanization in terms of socioeconomic growth. Migration is a major contributor to urbanization brings many advantages, their families and homeland overseas benefit by raising living standards, quality of life, and access to education. The drawback, however, is that rapid urbanization, which is mostly the result of rural-urban migration, has put constant strain on the urban environment and infrastructure and is linked to social issues like urban unemployment, environmental deterioration, and health issues (IKONNE, 2025). Noteworthy domestic and international migration flows, arguments regarding climate migration usually revolve around exaggerated forecasts and scare tactics that overstate the number of migrants. Forecasts of 200 million climate migrants by 2050 were widely published in the early 2000s. Most people avoid migration due to human psychology (Waters, 2025).

The research on climate migration has been dominated by quantitative studies however qualitative work comparing Delhi and Karachi climate migrants, inequalities, policies and coping strategies are rare. This research examines narratives and experiences of climate migrants on UHI, urban inequality and emphasizes encouraging developments focusing them although there is much discussion about climate migration, few studies look at changes over time and between cities. The connection between climate migration and UHI

seen in Delhi and Karachi highlights the need for research and action that focuses on the lives of the most vulnerable. As more people move to cities and climate change progresses, we must work to help climate migrants in urban areas that suffer from UHI.

1.2. Research Gap

The majority of current research just quantifies the UHI phenomena (Kotharkar et al., 2018). They focus on focus on land-surface temperatures (Maharjan et al., 2021), it's cause and impact (Hussain et al., 2022; Kamal, 2022), and review and critique Heat Action Plans (HAPs) (Habib et al.; Magotra et al., 2021; Ravindra et al., 2024; Singh et al., 2024), policy formations or adapting strategies (Akhtar, 2024; Golechha et al., 2021; Khan et al., 2024; Pillai & Dalal, 2023). It has been particularly challenging to outline the lived experiences of urban climate migrants using a qualitative approach, with most articles failing to adequately describe its "climate migrants" and "UHI" features. Its causes and effects with perspectives of climate migrants are not thoroughly examined yet rarely disaggregate data and qualitative insights for migrants. None compare Delhi and Karachi cities which are the most populated and UHI effected with contrasting governance but similar migrant struggles. The current article addresses this gap by collecting and analyzing migrants' narratives and experiences, gender inequality and emphasizes encouraging developments focusing them by asking the question *RQ: How do climate migrants in Delhi and Karachi experience and narrate health risks from Urban Heat Islands?*

1.3. Study Aim and Significance

Study aims to define migrants' experiences of Delhi and Karachi, compare how Delhi's UHI policies vs. Karachi's governance voids shape health outcomes. The study will be the first to examine, analyze and compare voices of such densely polluted cities which are under the influence of UHI. The comparison itself is unique as one has regulatory policies for UHI and the other doesn't even though both cities' migrants face and narrate similar experience. Qualitatively analyzing these voices will help inform urban planning frameworks, policy reforms, and regulatory developments focused on protecting climate migrants.

2. Literature Review

2.1. Impact of UHI on People and the Environment

Waste heat is released into the sky by industry, transportation, and air conditioning, while solar radiation is absorbed by hard metropolitan surfaces and reradiated as heat. The most extensively studied effect of climate change is that of UHIs. The interaction of UHI and global climate change presents significant obstacles to human development, health, and well-being. Preventing urban overheating is becoming increasingly important because the majority of people in the twenty-first century live in cities. Significant mitigation methods have emerged in recent decades, including high-tech materials, interactive water features, and urban greening. To handle urban heat in various climatic situations, a range of mitigation strategies are needed (Santamouris et al., 2019). As cities expand, roads, buildings, and other infrastructure take the place of open spaces and plants, changing the local climate and increasing local temperatures. Effective mitigation and adaptation strategies that utilize both natural and artificial cooling technologies must be developed and implemented to counteract the ongoing rise in urban heat intensity and the increasing frequency and severity of heat waves (Santamouris & Osmond, 2020). Elevated urban temperatures significantly impact the health and well-being of residents as compared to the surrounding countryside The chief causes of UHI are increased human heat output and the use of man-made materials (Mohajerani et al., 2017). Delhi, a rapidly expanding megacity, is strongly affected by the UHI phenomenon and faces serious environmental and public health challenges. Urban hotspots (UHSs) and cold spots are caused by variations

in the intensity of the UHI in different parts of the city; UHSs are primarily located in eastern and central Delhi, accounting for approximately 45% of the entire area. UHIs, which are caused by changes in the biophysical landscape, have a negative impact on infrastructure, resources, human health, and environmental quality. With a population of 28.5 million, Delhi is the most populous metropolis in India and the most urbanized (classified as a "high density urban") city. As a result of the intensifying surface UHIs (SUHI) footprint, Delhi exhibits the highest levels of nighttime stress in urban environments. The widening gap between ambient air temperatures and heat threshold levels in megacities like Delhi will continue to grow due to rising mean annual SUHI growth rates and the increasing frequency of prolonged and extreme heat waves (Gupta, 2024). In Karachi, which is home to more than 20 million people and is projected to reach 24 million by 2030 (Naveed, 2017). The increased heat associated with UHI tends to intensify stress levels and poses serious health risks due to prolonged thermal exposure. The most common issues occurring during the night include respiratory discomfort, general uneasiness, thermal pains, fatigue, and a rise in temperature-related mortality and morbidity rates. Karachi has a high population density and is gradually growing more urban. Pakistani research reveals that Karachi is particularly vulnerable to the UHI effect. Mass migration is rapidly expanding in response to the loss of greenery and the expansion of the development area (Lakhan et al., 2023).

2.2. Climate Migration and Urban Vulnerability

South Asia, is home to an estimated 1.5 billion people. A growing proportion of this population now resides in urban areas. It is also expected to be most affected by climate change; its cities are at serious risk due to pollution and sea level rise, as well as from an increase in the frequency of extreme weather events such as storm surges, floods, and cyclones, as well as irregular monsoons and extremely high temperatures. Many cities are located on the coast, in desert areas, or in floodplains, where destructive floods have devastated livelihoods, demolished homes, and taken lives. Especially, where more than 800 million people currently live, are expected to face exceptionally high temperatures that will severely harm them (Anwar & Sur, 2021). As migration increases, cities grow quickly and urban land are replaced by built environments. Crop output in tropical South Asia, where these crops are currently grown at temperatures near their tolerance threshold, would be negatively impacted by temperature rise. Small-holder rain fed farmers, who comprise the majority of farmers in this region and have low financial and technical capabilities to adjust to climatic unpredictability and change, are anticipated to have the most significant impacts (Sivakumar & Stefanski, 2011). With a remarkably low degree of livelihood resilience, a substantial proportion of the populace of South Asian countries has been uprooted and migrated from their place of birth mainly due to vulnerability to environmental shocks (Islam & Khan, 2020). According to the literature, disadvantaged people bear the brunt of climate change and are more prone to relocate during extreme weather events due to low adaptive capacity (Bhatta et al., 2015). Given South Asia's susceptibility to climate change, which has been fueling migration and human displacement in the region, it is imperative to understand the science behind the phenomena (Jolly & Ahmad, 2019). Drawing from this body of work, we present a typology called Multilayered or Integrated Climate-Induced Migration (MICIM), which provides three explanations for this. First, temporary migration is viewed as a means of diversifying one's source of income, and its use is more prevalent during periods of extreme weather or other environmental change. Second, people frequently relocate to different places to avoid food and water shortages when agricultural output declines as a result of climate change or other weather events. Lastly, extreme weather events such as floods and cyclones can lead to sudden, forced relocation, particularly in vulnerable countries. Migration decisions in South Asian nations are significantly influenced by the level of socioeconomic inequality that currently

exists. Even when populations are vulnerable to climate change, relocation may not be a feasible option for all due to poverty, land tenure insecurity, or lack of mobility resources (Ahmed et al., 2024).

2.3. UHI: Experiences of Delhi and Karachi

Displacement and misery are occurring South Asian countries experiencing climate migration (Rahaman et al., 2024). Many people who migrate are choosing cities such as Delhi and Karachi because they hope to find jobs and safety from stresses brought by climate change. Yet, faces restricted access to everything, were identified as the primary drivers of both temporary and permanent migration from ancestral locations, according to a study that gathered data from 400 climate migrates households in Pakistan. Migration had a significant impact on both the origin and destination regions, either favorably or unfavorably (Hamza et al., 2024). In India, migrants face systemic exploitation. Human trafficking and abuses of human rights are more likely to occur among migrants facing hardship in India. Wage withholding, debt bondage, forced labor, bonded labor, and exploitative working circumstances are all examples of slave-like situations (Bharadwaj et al., 2022). As many as 74% of migrant workers reported that rising temperatures negatively impacted their health and ability to work (Kidwai et al., 2024). Pakistan's largest metropolis, Karachi, faces symptoms of global climate change include heat waves, which are made worse by increased urbanization, industry, and motorization, and are now linked to delays in the monsoon cycle (Arshad et al., 2020). Extreme and prolonged weather events such as heat waves are magnified by the UHI effect, increasing vulnerability for all sectors and residents of the megacity. Karachi has recently experienced climate change, with high forties temperatures and UHI that exacerbated the effects on infrastructure and people. Once the heat wave in Karachi killed over 1200 people from heat stroke and dehydration, and there were other contributing reasons. The heat waves in Karachi have been caused by a multitude of causes, including population expansion, urbanization, industrialization, an increase in cars, a more developed environment with less or no vegetation, less air movement, and a lack of ventilation because of the high density (Kamal, 2022). Studies show that females are disproportionately affected and, in some cases, more likely to migrate, particularly in response to environmental and economic pressures (Wu et al., 2022a). In 2015’s heat wave, temperatures exceeding 44°C were reported; reportedly hot enough to melt pavements; underscoring the extreme severity of UHI in the city. UHI hotspots in Delhi are concentrated in poorer areas, often where migrants live. These areas retain more heat at night due to poor building materials and minimal greenery (Mitchell et al., 2021). Climate migrants are living in worsened conditions. The majority of the homes are bricked and cemented, however they are devoid of enough windows and air conditioning. In the settlement, there are just two water sources. Due to a shortage of water, very few migrants have access to their own restrooms, which further exacerbates the situation (Prakash, 2022). Economic livelihoods have also been disrupted. Local authorities ordered the closure of several businesses operated by migrants; including food stalls and barbershops; leaving many without income. The local economy of those who considered remaining in the community with various stores in their own *jhuggis* was thus severely impacted. Those who remained could not make as much with a smaller consumer base because an estimated 10,000 people returned. As a result, a large number of stores were either closed or have been permanently declining, and their profits have been gradually declining as the departing populace had no reason to come back (Sajjad & Jain, 2014).

2.4. Governance and Adaptation for mitigating Climate Migrants Vulnerabilities

South Asia, consists of 25% of the world's population. Yet, policymakers still lack a comprehensive understanding of how climate change contributes to human migration and displacement (Rahaman et al., 2024). This is partly due to the difficulty of disentangling and quantifying the links between migration and

climate change. However, it is increasingly clear that climate change will lead to a surge in migration. To respond, improved resilience systems and support mechanisms are required. This includes both climate-specific and non-climate-related social protection measures for migrant workers to manage challenges at both source and destination sites. Stakeholders must collaborate and significantly increase spending on adaptation and resilience to address the multidimensional challenges migrant workers face in the context of climate disruption (Kidwai et al., 2024). Karachi, a city of nearly 20 million people, exemplifies how governance gaps are driving unsustainable urban expansion and inadequate service delivery. Due to the city's limited growth as well as social, economic, and environmental problems, vulnerabilities have been created that may make climate change-related weather events more severe both locally and nationally. In order to encourage dialogue and action on climate change adaptation strategies, this article attempts to identify and highlight vulnerabilities and connections (Hasan et al., 2017). The surge of migrants caused major disruptions to Karachi's water supply, which in turn led to a loss of livelihood and an increase in stress, anxiety, and mental health problems (Zulfiqar A. Bhutta, 2025). To reduce heat-related illness and fatalities, the city must prioritize infrastructure upgrades in high-risk neighborhoods and ensure improved protection for vulnerable groups, especially the elderly. One promising strategy includes the widespread implementation of indoor “cooling centers” for at-risk populations during heat waves. Urban studies using kilometer-scale spatial data further reinforce the value of targeted risk-reduction interventions (Wu et al., 2022b). Equally important is the development of gender-sensitive policies that recognize the unique vulnerabilities women face during migration, particularly in informal and unprotected environments (Wu et al., 2022a). New Delhi, with a population of 26 million, is the second-largest megacity in the world. Due to the absence of control over planning tools for urban transitions, its metropolitan area is extremely vulnerable. In the framework of Delhi's urban planning tools, policies, and research, modern urban development paradigms including "*sustainability*," "*resilience*," "*participated governance*," and "*smart cities*" are being articulated, viewed, but rarely implemented effectively. It appears that various these mitigations strategies are created yet not being followed (Santos et al., 2017). Although remittances are a growing resource for local adaptation in India, they have not been systematically integrated into government-led climate resilience planning. In theory, remittances could offer faster and more community-centered responses to climate shocks, but they are not being mobilized to support Delhi’s climate migrants (J et al., 2020). Despite the growing urgency, climate change remains a neglected area in India’s urban governance (Sharma et al., 2016). The government has not contributed for any betterment of migrants in Delhi. There is no any proof that the policies and support of the state led to any settlement of the migrants (Prakash, 2022). From the migrants’ perspective, this absence of political voice, citizenship rights, and legal protection results in heightened vulnerability to climate risks and economic precocity. Migrants in Indian cities are often invisible to the state apparatus or deliberately removed through coercive or discriminatory development projects. These conditions result in deep climate injustices (Chu & Michael, 2019). Therefore, after in-depth analysis of the literature above, it is quite evident that climate migrants’ voices have not been heard. Although, literature on refugee’s voices are still in abundance, however, climate migrants have not been looked upon. Neither researchers nor the government is paying attention to the detrimental conditions of the climate migrants worldwide. Delhi and Karachi, as megacities of South Asia, are home to large and growing populations of climate migrants, yet they remain largely neglected in climate governance discussions. This study seeks to highlight and document their experiences using qualitative insights derived from case studies, credible news media, and official reports from both cities. Despite facing recurring heat waves, rising urban populations, and a lack of targeted policies, the needs of these migrant communities remain unmet. To the best of our knowledge, this is the first study to conduct a comparative qualitative

analysis of Delhi and Karachi with a focus on climate migrant narratives; filling a significant gap in the current literature.

3. Methodology

3.1. Study's Design

A qualitative secondary research design is followed to analyze the lived experiences of climate migrants in Delhi and Karachi, focusing on health impacts from UHIs. By synthesizing existing data from academic, and media sources, this approach avoids primary data collection constraints while ensuring robust insights. This study employs a comparative case study framework (Aaltio & Heilmann, 2010; Lindgreen et al., 2021) to examine Delhi and Karachi.

3.2. Data Sources

Data was collected from two secondary resources that are academic literature consisting of ethnographies. Migration studies filtering for "climate migrants", "health", "urbanization" and "heat stress," Media documentation covering Delhi and Karachi. News articles from The Hindu (India) and Dawn (Pakistan) covering heat waves (2015–2024).

3.3. Inclusion Criteria

a. Articles Published during 2015–2024 on google scholar.
b. Population focusing on migrants.
c. Articles or their PDFs easily available.
d. Articles of Delhi and Karachi only.

3.4. Exclusion Criteria

a. Articles Published before 2015–2024 on google scholar.
b. Population focusing on general urban population.
c. Articles with no access or needs institutional login or subscriptions.
d. Articles except Delhi and Karachi.

3.5. Data Analysis

Qualitative data were analyzed using thematic analysis following Braun and Clarke's six-phase approach (Braun & and Clarke, 2006). An inductive coding strategy was used to allow themes to emerge organically from the data. Thematic analysis was done on the following bases:

a. Familiarity

A few migrant quotes/narratives on health impacts from the selected ones were reviewed initially to get an understanding of the recurring themes and patterns. This helped refine the framework for coding.

b. Coding

Manual coding via Excel was done. Each study, news or report was coded under one or more themes. Both deductive coding (based on the pre-determined themes) and inductive coding (identifying new, emergent themes from the responses) were utilized.

c. Thematic Analysis

The data was coded under the themes "no residency", "water scarcity", "gendered inequalities", and "health issues".

d. Descriptive analysis

Thematic analysis was followed by descriptive analysis. Frequencies and percentages of the repeated themes were counted and mentioned explicitly stated for concluding the results.

3.6. Data Reliability

Two independent coders reviewed all transcripts and discrepancies were resolved through consensus. A third senior reviewer verified final themes to ensure reliability, identifying recurring patterns. Triangulation via cross-check findings across source types (reports, media, news, published articles) was also incorporated.

3.7. Ethical Considerations

As the data consists of secondary research and publically available narratives and no primary data was incorporated to avoid confidentiality issues, therefore, no the research is exempted from any ethical approval considerations.

4. Results

The Thematic Analysis of the study is shown in ***Figure 1*** below which revealed the below mentioned themes.

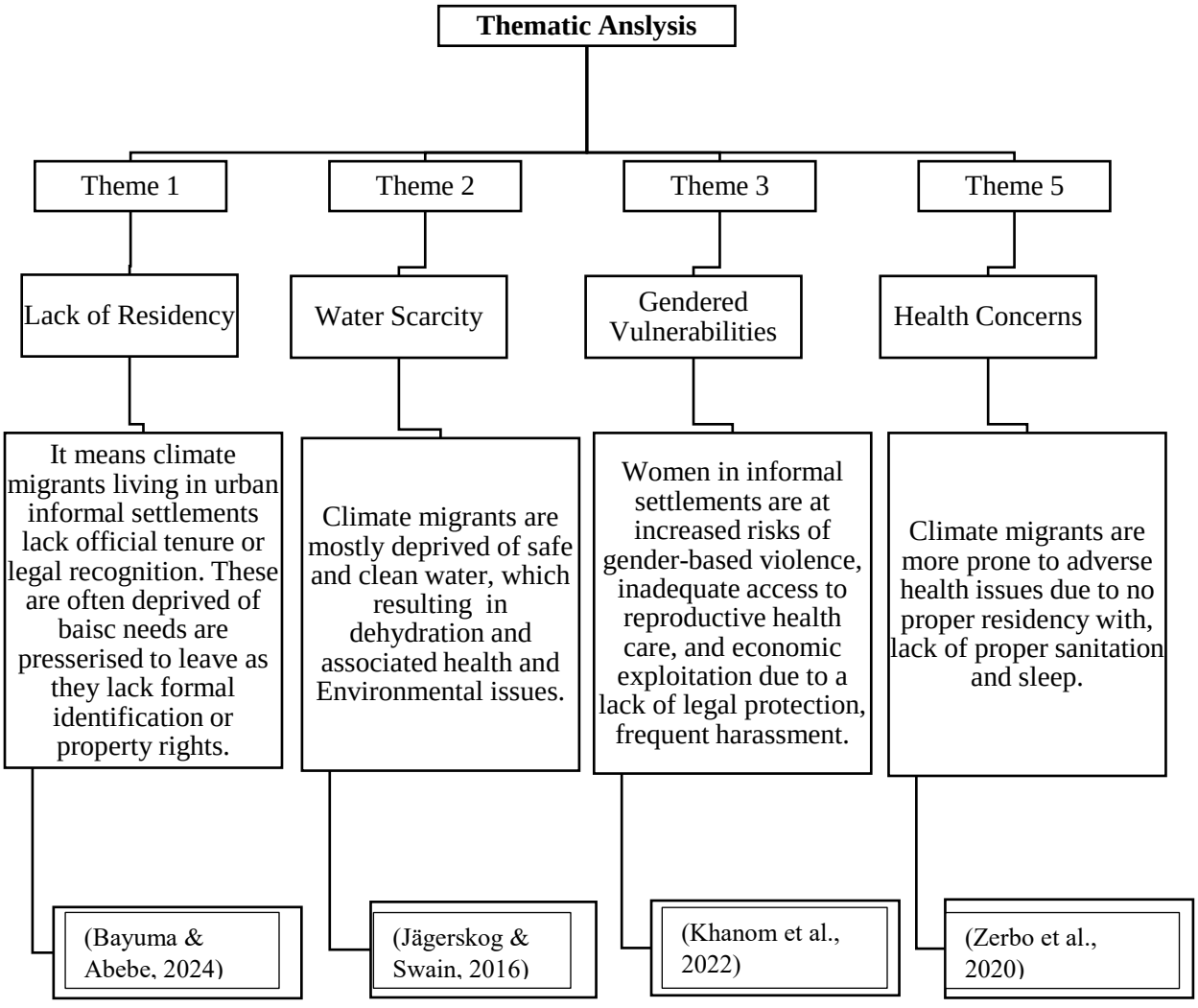

Figure 1. Thematic Analysis of the Qualitative Data from Delhi and Karachi.

Error! Not a valid bookmark self-reference. shows the experiences of climate migrates from Delhi gathered, evaluates and analyzed from the present literature.

Table 1. Qualitative Analysis of Climate Migrants in Delhi's UHI

Theme	Impact	Academic Reference	Report	Media Coverage	Frequency (n)	Percentage (%)
1	Eviction threats, houses demolition, lack of formal housing	(Bhan, 2016; Mahdi & Mazumder, 2023)	(Chaudhry, 2021; Research, 2015)	(Dutta, 2023)	23	34
2	Hydration crisis, water mafias, sanitation challenges	(Ahamad et al., 2023; Narain, 2021)	(Aijaz, 2020)	(Bello, 2018b; Edition, 2025; Vatter, 2019)	18	27
4	Gendered risks, unsafe water access, psychological stress	(Kher et al., 2015)	(Express, 2020; IUNC, 2020; Richhariya, 2024)	(Shalini Sinha, 2024)	14	21
5	physical and mental health at stake	(Barthwal et al., 2022; Kacker et al., 2024; Sajjad & Jain, 2014)	(Aijaz, 2020)	(News, 2024)	11	17

Table 3 mentions quotes of Delhi migrants related to each themes.

Table 2. Quotations of the Climate Migrants in Delhi

Number	Themes	Quote
1	Lack of Residency	*"On 15 April 2021, officials from DDA demolished my home without notice... Where will we go during this pandemic?"* Says a 15-year-old boy whose home was demolished in Yamuna Khadar, Delhi (Chaudhry, 2021).
2	Water Scarcity	*Despite the looming threat, "nobody monitors where and when wells are drilled, even if in theory you would need permissions", "Even if there's a problem, you pay someone a few hundred rupees and the problem goes underground"* Says Asit Biswas (Bello, 2018a).
3		*"Even though we received a favorable court order and I have complied with all official requirements, the government refuses to give me*

	Gendered Vulnerabilities	*alternative housing… I have four young daughters and fear for their safety. We face routine harassment from passers-by, especially men."* Said a single mother rendered homeless after demolition of her home in Delhi (HLRN, 2020).
4	Health Concerns	*"By evening, our feet are swollen, and we can't even feel our toes properly,"* Said a trader in Delhi (Lo, 2025).

Table 3 describes the themes evaluated after deep searching the information available all over the academic papers, repots, newspapers, media and confining it in our study.

Table 3. Qualitative Analysis of Climate Migrants in Karachi UHI

Theme	Impact	Academic Reference	Report	News Papers	Frequency (n)	Percentage (%)
1	Housing insecurity; informal settlement growth	(Fazal & Hotez, 2020; Hasan et al., 2017)	(Bank, 2016)	(Harper, 2024; Muhammed Toheed, 2025)	18	22
2	Severe hydration stress; waterborne diseases	(Khan & Arshad, 2022)	(UN-HABITAT, 2023; WWF, 2019)	(Andrews, 2022)	22	25
3	Women and girls at higher risk during heat events	(Sawas et al., 2020)	(ILO, 2023-27; UNDP, 2020; Zaidi, 2022)	(Ebrahim, 2025; Muhammed Toheed, 2025)	20	24
4	Increased heat-related illnesses; lack of treatment access, infection,	(Fazal & Hotez, 2020)	(ILO, 2023-27; International, 2023; Zaidi, 2022)	(Awan, 2025; Ebrahim, 2025)	24	29

Table 4 mentions quotes of Delhi migrants related to each themes.

Table 4. Quotations of the Climate Migrants in Karachi.

Number	Theme	Quote
1	Lack of Residency	*"As soon as the builders get permits, we (the poor and the vulnerable) get evicted."* Said by slum dwellers in Karachi (Muhammed Toheed, 2025).
2	Water Scarcity	*"Water doesn't come to us, we have to chase it,"* Said Shazia Bibi, from Orangi Town, Karachi (Salim, 2025).
3	Gendered Vulnerabilities	*"The sea took our nets, then our dignity … we were eventually forced to move out."*

		Said by Fareeha who lives in Karachi's Ibrahim Hyderi (Muhammed Toheed, 2025).
4	Health Concerns	*"It's all over my body, I'm always scratching here and there."* Said by Bibi Gultaja, Karachi (Ebrahim, 2025).

Table 5. Comparative Table of Climate Migrant Vulnerabilities in Delhi vs. Karachi (2015–2025).

Number	Theme	Delhi (India)	Karachi (Pakistan)
1	**Evictions/ Displacement**	Forced evictions in Yamuna Khadar, Janta Camp without rehabilitation; residents lack property titles. *The government claims it has to remove houses in this area to increase greenery along the banks of the Yamuna River.* Said a 45-year-old man evicted in Delhi (Chaudhry, 2021).	The population living in Machar Colony was removed Forcefully due to lack of legal recognition and CNICs. *"Hum maren ge, magar yahan se utthen ge nahee" (we will die but will not move out from here).* As one of the respondents mentioned (Raza, 2018).
2	**Water Scarcity**	Slum residents depend on private tankers, leading to scams and unequal distribution. *"Even if there's a problem, you pay someone a few hundred rupees and the problem goes underground."* Said by a migrant residing in Delhi (Bello, 2018a).	Tanker mafia controls access; poor pay high prices for water. *"I can still feel the depression in my skull. We had two or three police mobiles accompanying us, but they're scared of the mafias themselves and do nothing."* Said by the reporting official (Anwar et al., 2020)
3	**Gender Insecurity**	*The toilet that I'd built was also destroyed during the demolition. This has forced my daughter and wife to defecate in the open. The government has not built a single toilet in this settlement with nearly 500 families.* Said a 45-year-old man evicted in Delhi (HLRN, 2020)	*"While men can sit outside for fresh air, we remain indoors, struggling with heat and stuffiness*." Said by Perween Kanwal, lives in Orangi, another informal settlement of Karachi (Ebrahim, 2025)
4	**Health Impacts**	*"With clinics often hostile or overcrowded, workers self-medicate, ignore symptoms, or work through illness until their bodies break down. Climate crisis, in this context, is not just ecological, it is deeply biological, marked by silent inflammation, exhaustion, and untreated*	*"In the last six months I can't recall when I had a full, uninterrupted night's sleep, tiredness is now part of my being,"* Said Matan working as a housemaid in Karachi (Ebrahim, 2025).

		ailments," the report found. (Lo, 2025)	

5. Discussion

The study highlighted in ***Table 1*** and ***Table 3*** that a large number of climate migrants in both cities have no formal legal status. Regardless of how Delhi and Karachi are governed, sharing the same problem of insecure living means both groups of migrants suffer more from evictions and social exclusion. The data backs up the main finding of *"Lack of Residency,"* since the narratives pointed out that migrants often face more difficulties due to their invisibility in the law. It also underlined that problems associated with limited water highlighting the danger of water scarcity and dehydration to the health of those living in deserts confirming the theme of *"Water Scarcity"*. The statistics from Delhi and Karachi prove that women migrants deal with more social threats than men which is reflected in the *"Gendered Vulnerabilities"* theme. Both the cities are also experiencing similar health challenges related to infections, poor sanitation, allergies, tiredness and serious cases among climate migrants as mentioned via theme of *"Health Impacts."*

Delhi's vast population and increasing urbanization provide numerous and significant issues. For more than ten years, researchers have been examining its relationship with UHI. A larger population translates into higher energy use, a greater demand for residential and commercial space, and more transportation needs (Arif, 2024). With a population of about 24 million, Karachi has emerged as a popular location for internal migration. In addition to security concerns and uncontrolled expansion in the city, which cause housing and employment issues, 45% of Karachi's migrant population lives in shanty settlements known as "katchi abadis," which lack ownership, leadership, and policy changes. Because Karachi has a harbor, it has become Pakistan's commercial and industrial center, attracting people from all over. Karachi has become the most varied area in the country as a result of both internal and external migration. According to studies, half of Karachi's population lives in these katchi abadis, or slums (Iqbal et al., 2018; Naveed, 2017). UHI effect has a significant impact on both locations, exposing migrants' health at significantly higher risk. The city retains heat longer into the night because of its congested areas, numerous heat-absorbing surfaces, and dearth of greenery. Nighttime UHI peaks in the most vulnerable parts of the city, which are also home to a large number of climate migrants. These places exacerbate heat-related issues since they typically have inadequate ventilation, heat-absorbing structure, and a limited water supply. Numerous studies have evaluated similar effects of UHI on different regions (Dou & Miao, 2017; Macintyre et al., 2018; Sarker, 2022).

Forcibly leaving their homes, displaced, and receiving little assistance from the system are all common experiences for climate migrants in Delhi and Karachi. The Delhi Developmental Authority (DDA) and other Delhi government organizations have conducted demolition efforts frequently over the years. Without warning, 150 houses were demolished in the vicinity of the Akshardham Temple in October 2020. The building's 40-year residents were left homeless and unable to find employment to support themselves after the eviction. Even though they had long been involved in the city's unofficial economy, residents of Machar Colony in Karachi were also expelled for no other reason than that they were allegedly occupying the land unlawfully. People without CNICs risk being denied access to crucial services as well as legal protections (Raza, 2018). Being forcibly evicted from your home disrupts both your financial and physical stability. The shutdown of local economies and microbusinesses as a result of these displacements is extremely detrimental to locally based revenue-generating opportunities (Sajjad & Jain, 2014). Due to the higher cost of living in urban areas and the scarcity of employment opportunities, poverty and health problems worsen.

Gender plays a major role in evictions because women are particularly at risk for abuse, lack of privacy, and inadequate bathrooms. A Delhi homeowner claimed that his wife and daughter were subjected to potential harassment when they had to go outdoors to defecate due to inadequate household sanitation (HLRN, 2020). Women in Karachi's Orangi Town neighborhood claim that the effects of climate change have put them in more danger (Ebrahim, 2025).

Climate migrants in Delhi and Karachi also deal with high temperatures and a lack of water as quotes in ***Table 2*** and ***Table 4*** represents. The water tanker mafia dominates water supply in slum areas, resulting in illegal control over something that everyone needs. As one village member pointed out, there is insufficient water during the summer months (WWF, 2019). Inadequate water supply and limited access raise a number of public health concerns. Water insecurity in Karachi is caused by systemic inequity rather than a scarcity of water. Dry environment, insect-borne diseases, and poor sanitation disproportionately harm migrant groups (Khan & Arshad, 2022). Vulnerable groups are becoming increasingly marginalized as a result of Lyari's inadequate urban water governance. The sporadic piped water supply in Lyari is insufficient, risky, inconsistent, and inconvenient. This leads to significant inequities in water availability as many households switch to more costly and inconvenient water sources. Particularly impacted are those with lower incomes, who pay disproportionately higher prices for significantly less water use. Increasing water resources alone is not enough to address the water issues in megacities in the Global South. Although increased water supply can be beneficial, the findings suggest that institutional frameworks and policies are still necessary for Lyari and other comparable communities to ensure fair and more just access to both current and future water resources (Khan & Arshad, 2022). The similar of problems exist in Delhi. Because migrants rely on private water tankers, they are frequently mistreated, and water resources are chronically scarce (Bello, 2018a).

An assessment of the themes revealed that gender vulnerabilities are a common and recurring element of climate-driven migration. Data from Delhi and Karachi show that women are endangered by issues such as privacy, sanitation, harassment, and the risk of using public spaces. This stems from more than just a concern of security; it also demonstrates how climatic migration exacerbates urban poverty inequality. The quotes about gender inequality in ***Table 2*** and ***Table 4*** highlight the difficulties women face. Researchers such as Anwar et al. (2020) and Sawas et al. (2020) point out that in Karachi, women do the majority of the work involved in dealing with water and heat since they have little family support and few transportation options (Anwar et al., 2020; Sawas et al., 2020). In these cities, women are more affected than males by the lack of restrooms and bathing areas. Residents in Delhi were forced to defecate in public spaces after toilets were destroyed during evictions. Women in both cities claimed that in addition to losing their homes, they also lost their dignity (Ebrahim, 2025). These climate migrant women's experiences increases women's susceptibility to gender-based violence and exploitation (Bharadwaj et al., 2022). The outcomes are by no means restricted. Women in these cities are not just climate migrants but also survivors, workers, and caregivers. The ways that patriarchy, urban heat, and climate change impact various populations are not taken into consideration by frameworks that disregard gender in migration and disaster situations. Resilience frameworks should prioritize secure housing, water, and mobility for women.

The results emphasize that a number of factors contributed to health issues in climate migrants like stress, including lack of water, heat, worry, disturbed sleep, and infections they neglected to address. Research indicates that climate migrants frequently suffer from poor health, stress, and systemic neglect. Both migrants and informal laborers are more likely to experience urban heat exposure and, because of the lack of easily accessible or reasonably priced healthcare, frequently self-treat their illnesses or wait for care (Barthwal et al., 2022; Fazal & Hotez, 2020). Heat stress brought on by climate change and poor water

management become major threats in Karachi since there are several disconnected health services and little control over them. According to a recent study, 74% of workers who migrated to hot regions reported that heat waves negatively impacted their productivity and health (Kidwai et al., 2024). Clinics near Delhi's informal communities lack adequate resources and a conducive atmosphere for unauthorized migrants. Climate migrants who internalize these symptoms wind up with untreated diseases, excessive fatigue, and silent inflammation (Bello, 2018a, 2018b). The impact of climate change on urban social disparity is reflected in these health issues. Important services are already unavailable to migrants, and UHI zones make matters worse. The findings support the recommendations made by Duminy (2023) and Sharma et al. (2024), who suggest integrating public health services with climate resilience when planning for low-income and immigrant populations (Duminy, 2023; Sharma et al., 2024). The results show that these variables are not affected by the seasonal change. People may experience particular hardships over the summer, but ongoing deprivation of housing, healthcare, water, and mental health services eventually results in chronic insecurity and a condition known as "slow violence," in which disparities in harm are not recognized (Tyner, 2020).

The goal of this study was to investigate the experiences of climate migrants in Delhi and Karachi, two South Asian cities with radically different political systems but comparable challenges in aiding climate migrants. Climate migrants describe similar hazards in Karachi and Delhi, despite Karachi having fewer municipal assistance and climate change initiatives than Delhi. The outcomes demonstrates how some groups are frequently left out of Delhi's official plans, such as expanding the green space along the Yamuna. The displacement of informal dwellers is typically concealed by political rhetoric like "*beautification*" or "*ecological restoration*," which diminishes the significance of migrants in policymaking (Bhan, 2016; Chaudhry, 2021). Another instance involved the abrupt and unannounced eviction of residents from the Yamuna Khadar due to environmental clearance (HLRN, 2020). Karachi presents a different, but no less dire, circumstance. Settlements like Machar Colony and Lyari are frequently disregarded, have an excessive number of inhabitants, and receive little assistance because Karachi lacks proper urban planning and is primarily an unofficial community (Hasan et al., 2017). Despite the fact that migrants contribute to the growth of Karachi's informal sector, they remain vulnerable due to unclear property titles and CNIC documentation. Every day, migrants deal with the water mafia, land appropriation without authorization, and eviction of those who are not compensated for their land (Khan & Arshad, 2022). Because of this, Delhi targets migrants with policy tools, while Karachi receives little government attention and little administrative action. However, migrants are at risk in both situations, particularly women, unskilled workers, and those without legal documentation. In addition to policy, the implementation method, the way individuals are involved, and the accountability of the systems all show failure.

This analysis supports the findings of recent research, which show that urban climate migrants are currently not adequately protected by the governance structures in place (Chu & Michael, 2019; Kidwai et al., 2024). There are no city-level strategies that address climate migrants' housing, employment, gender, and health in a rights-based manner. Although there is a Delhi Urban Shelter Improvement Board (DUSIB), it is frequently disregarded during demolitions or does not receive the support it requires. Their survival efforts are viewed as crimes since they are deemed to be unlawful squatters and not entitled climate-affected individuals (Prakash, 2022). The governance issues facing the city are increasingly serious. Weak municipal leadership, overlapping spheres of jurisdiction, and a division of political authority sabotage even the best initiatives. For example, following the 2015 Karachi heat wave that killed over 1,200 people, there were hardly any organized cooling facilities, and those that did exist hardly ever catered to the most vulnerable

groups (Arshad et al., 2020; Awan, 2025). Additionally, it is evident from both cities that the existence of climate migrants is not being recorded by data systems. The majority of them are not included in decision-making, do not appear in census records, and are not registered to vote. Poor people frequently lack access to clean water, climate-resistant housing, and health care because they are invisible (Koubi et al., 2016).

This study emphasizes the necessity for a climate justice strategy that prioritizes the needs, rights, and security of urban climate migrants. Delhi and Karachi, the major economic hubs, exploit the work of migrants without guaranteeing that they receive their due compensation. In addition to infrastructure, these frameworks should take into account housing rights, water policy for women, health care access for immigrants, and public participation in civic decision-making. A city should only be taken into consideration when it works to defend its weakest, not merely its middle class or real estate groups (Anwar & Sur, 2021; Chu & Michael, 2019). According to this study's qualitative evidence, climate migration involves not only changes in the environment, but also the failure of institutions, gender inequality and the neglect of cities. It looks at how heat waves, not enough water and people being evicted from their homes relate to ongoing caste, class and identity problems in cities in South Asia. The qualitative data from this study suggests that climate migration encompasses not only environmental changes but also institutional failure, gender inequity, and urban neglect. It examines the connections between persistent caste, class, and identity issues in South Asian cities and heat waves, water scarcity, and home evictions.

6. Conclusion

To the best of our knowledge, this is the first study to conduct a qualitative comparison of the climate migrants of climate migrants in Delhi and Karachi. The study followed a thematic analysis approach and used secondary data to avoid ethical conflicts. It triangulated insights from academic studies, verified reports, and reputable media narratives to understand migrants' lived experiences. Findings revealed that both Delhi and Karachi are megacities hosting large populations of climate migrants who face critical governance and rights deficits. As many rural residents in India and Pakistan migrate to Delhi and Karachi respectively due to severe climatic conditions they often end up in informal settlements with precarious living conditions, frequently threatened by demolitions without rehabilitation. This research uniquely highlights the urgent need for policy reforms, human rights protections, and infrastructural support for climate migrants in both cities. Despite their economic significance, both cities fail to safeguard the rights and well-being of these vulnerable populations. Government should take immediate steps and form legal policies and rights for them to survive like humans. Although, the study is a potential source for the literature it contains a few limitations. Reliance on grey literature may introduce interpretive bias. The study is limited to two cities only, broader generalizability may require multi-site comparisons. Lastly, no primary data collection was performed which limits firsthand insights. Future studies should include cities such Dhaka and Lahore too for broader regional comparison. Investigate and evaluate governmental mitigation and adaptation frameworks. Call for establishing transparent funding allocations, data systems, and enforcement of migration-related issues.

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All author/s have equally contributed to the study.

Ethical approval

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