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Mental health impacts of climate migration: Urban adaptation and mitigation challenges in Southwestern Bangladesh

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ABSTRACT

This study explores the mental health impacts of climate migration in Khulna City, focusing on the urban adaptation and mitigation challenges faced by migrants. As climate-induced environmental changes like salinity intrusion, riverbank erosion, and flooding increasingly affect rural areas of southwestern Bangladesh, large numbers of people are migrating to urban centers in search of safety and stability. The study employs qualitative methods, including semi-structured interviews and focus group discussions with 100 climate migrants in Khulna. The findings reveal significant psychosocial stress among migrants, manifesting in issues such as anxiety, depression, and ecological grief. Overcrowded living conditions, lack of green spaces, and limited social support exacerbate these mental health challenges, underscoring the need for urban adaptation policies that prioritize both physical infrastructure and psychosocial well-being. This research highlights the importance of integrating mental health services into urban planning to address the unique needs of climate migrants. Additionally, the study emphasizes the role of social networks and community-based support in facilitating migrants' integration and emotional recovery. The findings provide valuable insights for policymakers and urban planners to develop more inclusive and resilient urban strategies that address the multifaceted challenges faced by climate migrants.

1. Introduction

Climate change is one of the most pressing challenges facing humanity today, with its impacts becoming more evident across the globe [1]. In coastal regions like Bangladesh, climate-induced hazards such as rising sea levels, increased salinity, and extreme weather events, including cyclones and floods, are causing severe disruptions to both the environment and human populations [2,3]. The country, particularly the southwestern coastal regions, is facing a growing crisis where natural landscapes are being altered at an alarming rate, resulting in increased climate-induced migration. The migration of populations due to the degradation of land and livelihoods is increasingly recognized as a direct consequence of climate change, with displaced individuals seeking refuge in urban centers like Khulna City [4,5].

Khulna City, located in the southwestern part of Bangladesh, has emerged as a significant destination for climate migrants [6]. The region is characterized by its vulnerability to various climate stressors, such as salinity intrusion, riverbank erosion, and flooding, all of which have resulted in the gradual displacement of rural communities [7]. As the climate crisis intensifies, migration from rural and peri-urban areas into urban centers has become a widespread phenomenon, with Khulna City being one of the primary urban hubs for such displaced populations [8,9]. However, while the focus has often been on the physical aspects of migration, such as the relocation of communities and the need for infrastructure, the psychosocial impacts of migration have received significantly less attention [10]. Climate migrants, who are forced to leave their homes due to environmental factors, face numerous challenges when they relocate to urban areas. These challenges are not just physical but also psychological, as migrants often struggle to adapt to new urban environments while dealing with the emotional toll of losing their homes and communities [11]. The loss of place attachment, the emotional bond that people have with their land and home, is one of the most significant psychological impacts of climate migration. The disruption of these attachments leads to ecological grief and a sense of displacement trauma, which compounds the already difficult process of urban adaptation [12,13].

The mental health consequences of climate migration are not limited to feelings of loss but also extend to a profound sense of liminality—the

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emotional instability experienced by migrants who find themselves between a lost rural past and an uncertain urban future. Many climate migrants in Khulna experience anxiety, depression, and social isolation, as they are forced to navigate new and often hostile urban landscapes without the necessary support systems in place [14,15]. These psychological challenges are often exacerbated by overcrowded living conditions, inadequate housing, and limited access to healthcare, all of which are prevalent in urban centers like Khulna [16,3]. In this context, urban adaptation strategies—policies and measures designed to help cities cope with the challenges of climate change—are critical in addressing the needs of climate migrants. However, mental health is rarely integrated into these strategies. The lack of psychosocial support in urban planning and policy frameworks means that the mental health needs of climate migrants often go unmet, leading to prolonged emotional distress and social marginalization [17,18]. Migrants in Khulna City often struggle with housing insecurity, overcrowding, and limited access to green spaces, all of which contribute to increased stress and anxiety [5]. The challenges faced by climate migrants in Khulna highlight the urgent need for holistic urban adaptation policies that address both the physical and psychological impacts of climate migration. While much of the current discourse around urban adaptation focuses on infrastructure, housing, and climate mitigation strategies, the mental health of climate migrants must be prioritized [15]. Climate migrants often face a unique set of stressors that require specific interventions, including mental health services, community-based support, and social integration programs [19].

This study aims to explore the mental health impacts of climate migration in Khulna City, with a particular focus on the adaptation and mitigation challenges that climate migrants face. The primary objective of this research is to investigate the psychosocial stressors faced by climate migrants in Khulna, including the emotional and mental health impacts of migration, and how urban adaptation strategies can address these needs [20]. Specifically, the study will examine how urban migration influences the mental health of displaced populations, with an emphasis on anxiety, depression, and ecological grief. Additionally, the research will assess the effectiveness of existing urban adaptation and mitigation policies in addressing the mental health needs of climate migrants, and it will identify the barriers to integrating psychosocial support into these strategies. By combining qualitative interviews with 100 climate migrants and an analysis of existing urban adaptation policies, this study aims to offer new insights into the psychosocial impacts of climate migration and propose recommendations for improving mental health support in urban areas [12]. The findings will contribute to the broader literature on climate migration and mental health, advocating for more inclusive and resilient urban planning that considers both the physical and emotional needs of climate migrants [16].

The study also seeks to provide actionable recommendations for policymakers in Khulna and other rapidly urbanizing cities in the Global South, where climate migration is likely to increase in the coming decades. These recommendations will focus on integrating mental health support into urban adaptation frameworks, enhancing community resilience, and ensuring that migrants are not only provided with shelter and services but also the psychosocial tools needed to rebuild their lives in a new urban context, [21–23]. This research aims to highlight the interconnectedness between climate change, migration, and mental health, urging a shift in how urban planning addresses these complex challenges.

2. Study area

Khulna City, located in the southwestern coastal region of Bangladesh, serves as the administrative, commercial, and economic center of Khulna District (Fig. 1). Situated between 21°41' and 23°00' North latitudes and 89°14' and 89°45' East longitudes, Khulna City is a low-lying, flat urban area, making it particularly vulnerable to climate change impacts such as salinity intrusion, riverbank erosion, and the threat of rising sea levels. The city lies near the Bay of Bengal and is one of the primary destinations for climate-induced migration, with many rural populations displaced by environmental degradation [24,7]. The migration to urban centers like Khulna is driven by the loss of agricultural productivity and livelihoods due to climate stressors, forcing many rural communities to seek refuge in the city [25]. Khulna's rapid urbanization in recent years has led to significant changes in land use, contributing to overcrowded living conditions, inadequate infrastructure, and limited access to essential services such as healthcare, clean water, and sanitation. The expansion of built-up areas has further strained the city's infrastructure, making it difficult to accommodate the growing population of climate migrants [8,26]. As the city expands, the challenges associated with urban adaptation—especially for climate migrants—become more pronounced, as migrants often settle in informal, poorly equipped settlements that lack the necessary resources for a decent quality of life [2,27]. Despite its economic importance, Khulna City presents several mitigation and adaptation challenges for displaced populations, who often struggle to integrate into urban life due to social marginalization, lack of green spaces, and limited support networks. The experience of psychosocial stress, including anxiety, displacement trauma, and ecological grief, is common among climate migrants in Khulna, highlighting the need for comprehensive urban adaptation policies that address both the physical and mental health needs of these migrants [17,20].

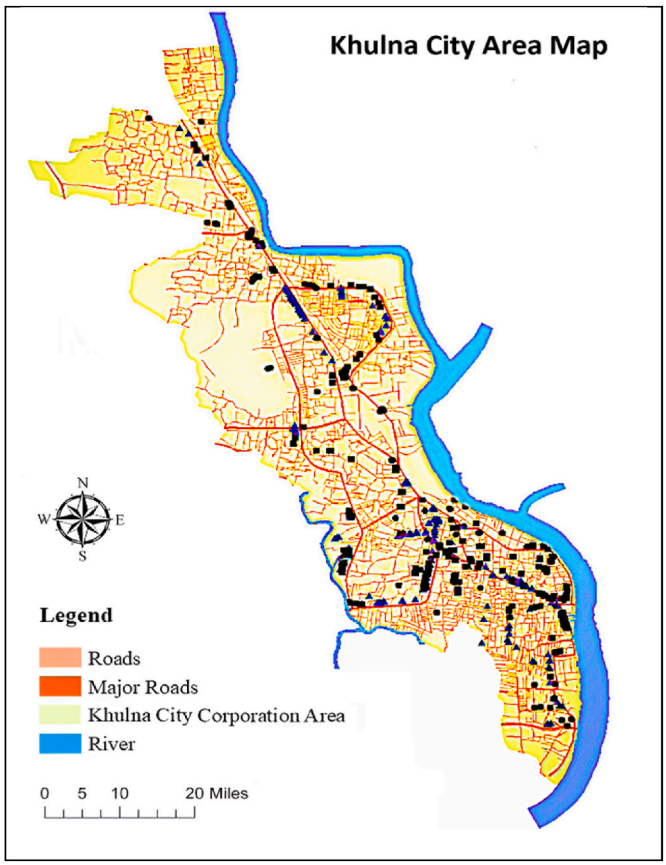

Fig. 1. Study area map.

3. Research methodology

This study employs a qualitative research design to explore the mental health impacts of climate migration in Khulna City, with a particular focus on the urban adaptation and mitigation challenges faced by displaced populations (Fig. 2). The research methodology is designed to capture the lived experiences of climate migrants and understand the

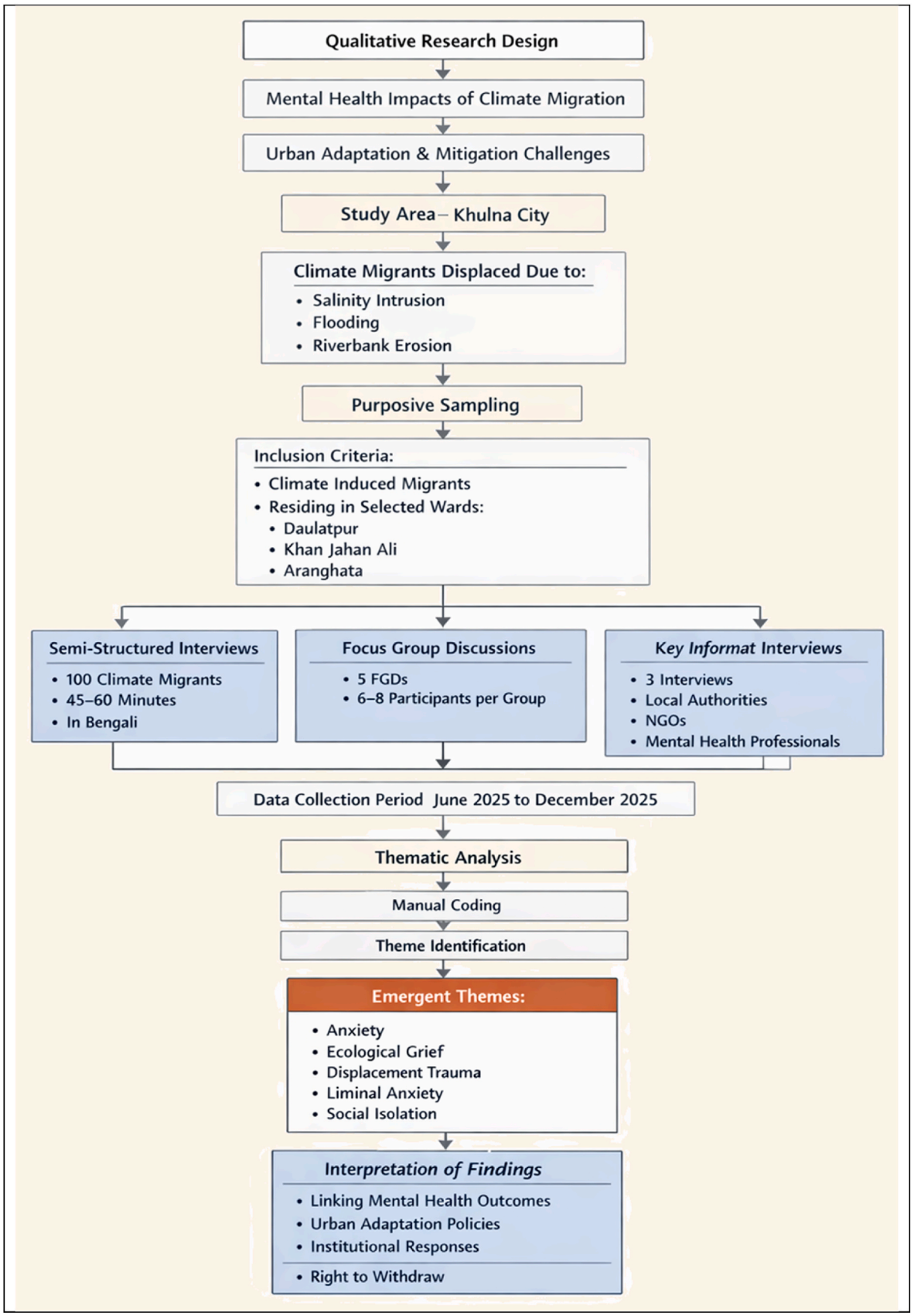

Fig. 2. Flowchart of the research methodology.

psychosocial challenges they face in their new urban environment. To achieve this, both qualitative data collection and thematic analysis are employed, with a specific emphasis on semi-structured interviews, focus group discussions, and key informant interviews.

3.1. Data collection

Data collection for this study was conducted over a six-month period, from June 2025 to December 2025. The primary data collection method involved in-depth semi-structured interviews with 100 climate migrants currently residing in Khulna City. The participants were selected based on their climate-induced migration from rural and peri-urban areas within Khulna District, which is known for its exposure to climate hazards such as salinity intrusion, flooding, riverbank erosion and impact of cyclones. The inclusion criteria for the participants were as follows: (1) migrants who relocated due to environmental stressors, including land degradation, salinity intrusion, or loss of agricultural land, and (2) individuals currently living in Khulna City, specifically in wards with high concentrations of displaced populations, such as Daulatpur, Khan Jahan Ali, and Aranghata.

The sampling strategy was purposive, aimed at selecting individuals who had direct experiences of climate migration and the psychosocial stress associated with displacement. This approach was designed to ensure that participants' experiences were relevant to the research objectives and that the data collected would provide a comprehensive understanding of the mental health impacts of migration. The interviews were conducted in Bengali and lasted between 45 min and 1 h per participant, allowing for rich, detailed accounts of their migration journeys, the challenges faced, and the emotional and psychological impacts of their experiences. In addition to the interviews, five focus group discussions (FGDs) were organized, with 6–8 participants in each group. These FGDs provided an opportunity for participants to discuss shared experiences of displacement, stress, and urban adaptation, enabling the study to capture collective insights and common themes across different migrant groups. The FGDs were facilitated by the researcher and a trained local assistant who ensured that participants felt comfortable and encouraged to share their thoughts. These discussions also provided valuable contextual information about how social networks, community support, and urban living conditions influenced migrants' mental health. Three key informant interviews were conducted with local authorities and community leaders in Khulna City. These interviews provided an institutional perspective on how urban adaptation policies were being implemented and the challenges faced in supporting climate migrants. The key informants included representatives from Khulna City Corporation, local NGOs, and mental health professionals who work with migrant communities. Their input helped to contextualize the migrants' experiences within the broader framework of urban policy-making and community support systems.

3.2. Data analysis

The data collected from qualitative interviews, focus group discussions, and key informant interviews were analyzed using thematic analysis to identify key patterns and recurring themes related to the mental health impacts and urban adaptation challenges faced by climate migrants. Initially, the data were read and re-read to gain a comprehensive understanding of the participants' lived experiences, after which the data were coded. Several critical themes emerged, including anxiety, ecological grief, displacement trauma, liminal anxiety, and social isolation. These themes represented the core stressors that climate migrants experience as they transition from rural, climate-affected areas to urban life in Khulna. Anxiety was linked to the uncertainty about the future and the fear of not being able to return to their homes, while ecological grief emerged as a significant theme reflecting the emotional distress migrants feel due to the loss of their land and livelihoods. Displacement trauma captured the emotional strain of being forced to leave one's home, and liminal anxiety referred to the sense of emotional instability that migrants feel as they are caught between a lost past and an uncertain future. Social isolation was another dominant theme, as many migrants struggled to integrate into the urban community, often feeling disconnected and marginalized in their new environment. These themes were carefully analyzed to understand how the psychosocial stressors related to climate migration impact the mental health of displaced populations. The final analysis also looked at how urban adaptation policies in Khulna either supported or exacerbated these challenges. The thematic analysis was conducted manually to ensure that the themes were grounded in the narratives provided by the participants, allowing for a deeper understanding of their unique emotional and psychological struggles. Throughout the data collection process, ethical standards were strictly adhered to. Participants were informed about the purpose of the study, and informed consent was obtained from all participants before the interviews and focus group discussions took place. To protect participants' privacy and confidentiality, all identifying information was kept anonymous, and pseudonyms were used in the final report. Participants were also informed of their right to withdraw from the study at any time without any consequences.

4. Results

4.1. Urban adaptation challenges faced by climate migrants

The urban adaptation challenges faced by climate migrants in Khulna City are complex and multifaceted. These migrants, who arrive from rural and peri-urban areas severely affected by climate change, often find themselves confronting a city that is already struggling with its own set of challenges related to rapid urbanization, limited infrastructure, and social inequality. Khulna City, while offering some economic opportunities, presents a difficult and often overwhelming reality for many migrants. As these migrants transition from rural life to urban living, they are confronted with overcrowded housing, inadequate sanitation, and a lack of basic services, which significantly affect their overall well-being and mental health. Many migrants shared their distress at the transition from a life rooted in rural landscapes to a crowded urban environment. One 41-year-old female migrant poignantly shared,

> *"In the village, we had our own land, we had trees, and we could grow our own food. Now, in the city, I live in a tiny room with no space to move. There is no peace here. I miss the fields, the open sky, the fresh air."*

These sentiments capture the profound sense of loss and disconnection that many migrants feel when they leave their rural homes and are forced to adapt to the physical constraints of urban living. This feeling of suffocation is often exacerbated by the overwhelming noise and constant movement of the city, which can induce anxiety and stress among newcomers who are still adjusting to their new lives. The lack of green spaces in Khulna City further amplifies the challenges climate migrants face. In their rural homes, they were surrounded by nature—open fields, trees, and fresh air—that provided not only physical sustenance but also psychological relief. In contrast, the overcrowded urban environment of Khulna offers little in terms of nature-based restoration. A male migrant, aged 45, said,

> *"The city is so crowded, and the buildings are too close together. There's no room to breathe. The noise and pollution make it hard to focus. I miss the quiet, the calm of the river near our home."*

These conditions contribute to the emotional distress many migrants face. The lack of natural elements, such as parks or even green streets, creates a harsh urban landscape that amplifies feelings of psychological isolation. Nature often serves as a form of psychosocial support, providing a calming environment and emotional grounding, something that is significantly lacking in Khulna City. Moreover, the housing crisis is a major contributor to the mental health struggles of climate migrants.

In Khulna, many migrants are forced to live in informal settlements where the housing is often substandard, with poor sanitation, overcrowded conditions, and limited access to clean water and electricity. As one migrant, a 38-year-old male, expressed, "The house we live in is falling apart. The walls are thin, and the roof leaks. Every time it rains, we have to move our belongings to avoid the water. It's stressful, and we never feel settled." This constant state of insecurity and stress affects the psychological health of migrants, as they are unable to establish a sense of stability or safety in their new environment. The harsh conditions of urban life, combined with the trauma of displacement, create a psychosocial burden that is difficult to overcome without adequate support.

These urban challenges highlight the urgent need for more inclusive and holistic urban adaptation strategies that prioritize not only physical infrastructure but also the mental health of climate migrants. Addressing issues such as housing security, green space development, and social support networks will be crucial in improving the well-being of these displaced populations. Urban planning should integrate the psychological needs of migrants, ensuring that they are not only provided with shelter but also with a healthy, supportive environment that promotes mental resilience and emotional recovery.

4.2. Mitigation and adaptation risks to mental health

While Khulna City's urban mitigation and adaptation strategies aim to address the physical impacts of climate change, such as reducing carbon emissions and enhancing infrastructure resilience, these strategies often overlook the psychosocial aspects of migration. As cities grow and develop in response to the impacts of climate change, climate migrants find themselves navigating not only the physical challenges of urban life but also the mental health risks associated with forced displacement. Many migrants arrive in Khulna City seeking better opportunities but are instead faced with psychosocial stressors that exacerbate their emotional and psychological burdens. A 42-year-old female migrant shared her frustration with the city's approach to urban adaptation, stating,

> *"We hear a lot about making cities sustainable and climate-smart, but no one talks about the people who are already here, struggling to survive. What about our mental health? What about our need to rebuild not just our homes but our lives?"*

This comment underscores the gap between the climate adaptation policies focused on physical infrastructure and the urgent need for psychosocial support for climate migrants. Although mitigation strategies, such as reducing emissions and improving urban infrastructure, are essential for long-term sustainability, they do not address the immediate psychological distress faced by migrants. Mental health support is often an afterthought, despite the fact that psychosocial stress significantly impacts migrants' ability to adapt to their new urban environment. The psychosocial challenges migrants face are compounded by the lack of support systems in the city. Migrants often find themselves socially isolated, far from their families, communities, and cultural roots.

One 48-year-old male migrant explained, "I don't have anyone here. My family is back in the village, and here, I don't know anyone. It's like being invisible. People don't understand what we've been through."

This social isolation is a key contributor to the mental health risks climate migrants face. Urban adaptation strategies that focus solely on infrastructure, without considering the psychosocial needs of migrants, fail to provide a comprehensive solution to the challenges these populations encounter. Furthermore, some of the urban mitigation measures, such as the installation of energy-efficient buildings or urban greening initiatives, could inadvertently exacerbate mental health risks for climate migrants. For example, energy-efficient cooling systems could lead to greater physical comfort but might increase economic pressure for those unable to afford these technologies. Similarly, the development of high-density housing in migrant areas, although aimed at solving the housing crisis, could lead to greater overcrowding and a sense of displacement, further affecting mental well-being. Thus, it is crucial that urban adaptation and mitigation strategies in Khulna are designed to balance physical improvements with psychosocial support, ensuring that mental health is an integral part of climate resilience efforts.

4.3. Psychosocial stress and trauma due to displacement

The psychosocial stress and trauma experienced by climate migrants in Khulna City go beyond just the physical displacement; they are deeply rooted in the emotional and psychological toll of losing their homes, communities, and sense of belonging. The most significant aspect of this psychological distress is the loss of place attachment—the emotional bond that individuals form with their land, home, and community. When this bond is broken, as it often is in the case of climate migration, it leads to a profound sense of grief, disorientation, and trauma. Many migrants shared powerful narratives of the devastating emotional impact of leaving their homes behind. One 50-year-old male migrant recalled,

> *"Leaving my land, my home, my memories—these are the hardest things I've ever had to do. My heart aches when I think about it. I keep dreaming of my old place, and it feels like part of me stayed there."*

This sense of loss is not merely about the physical displacement of belongings or structures; it is a deep emotional grief that lingers, often undetected, affecting mental health for years after migration. The loss of their ancestral land, often due to rising salinity or erosion, creates an identity crisis for many migrants. They lose not just their homes but also their connection to the land that had shaped their culture, livelihood, and sense of self.

Furthermore, the emotional distress linked to the disruption of livelihoods is compounded by the uncertainty of the future. Migrants are often unsure whether they will ever be able to return to their homes, or if their families can rebuild what they have lost. One 36-year-old female migrant expressed,

> *"The water came and destroyed everything. We kept hoping the soil would recover after every season. But each year the rice failed again, and when the land finally went underwater, it felt like a slow death. We were forced to watch as everything we had was lost."*

This slow-onset destruction, which doesn't provide an immediate escape or clear-cut resolution, builds a sustained emotional burden over time, which can lead to depression and chronic stress. The displacement itself—forced and sudden—adds to the emotional burden. Many migrants described feelings of being displaced forever, unable to return to their homes and trapped in an unfamiliar urban environment. One migrant, a 41-year-old female, said,

> *"In the city, I feel like I'm not a part of anything. I miss my village, my friends, and the simplicity of life there. I feel like I've lost everything, and here, it's hard to find anything that makes me feel whole again."*

These narratives underscore the emotional dislocation that accompanies climate migration. Migrants do not just leave behind physical structures; they leave behind memories, identities, and ways of life. This sense of loss continues to affect their mental health, often manifesting as anxiety, sleep disturbances, and constant worry about the future. This ongoing psychosocial trauma underscores the need for mental health support in adaptation strategies. Without addressing the mental health needs of climate migrants, urban policies will remain incomplete. Migrants need more than just shelter and basic services; they need psychosocial care and social integration programs to help them rebuild their lives emotionally as well as physically.

4.4. Liminal anxiety and uncertainty about the future

Liminal anxiety is a pervasive theme that emerged from the

interviews with climate migrants, as many expressed being caught in an emotional and psychological space between two conflicting realities: their lost rural past and their uncertain urban future. This anxiety stems from a profound sense of instability and uncertainty, as migrants struggle to find a sense of belonging or security in their new urban environment. The liminality of climate migration is not just about the physical transition from rural to urban; it also encapsulates the psychological transition that takes place when individuals are faced with the loss of their home and forced to adapt to a new way of life. A male migrant, aged 34, expressed this feeling of being trapped between two worlds:

> *"I don't know where I belong anymore. I can't go back to my village because it's gone. But I don't feel at home here either. Everything in the city feels temporary. I don't know what my future holds, and I can't escape the feeling of being lost."*

This uncertainty about the future creates a psychological burden, leaving many migrants with a constant sense of disorientation and emotional instability. Migrants live in a state of limbo, unsure whether they will ever be able to return home or if they will truly find a place for themselves in the urban landscape. The psychological impact of this uncertainty is profound, leading to increased feelings of hopelessness, stress, and anxiety. The uncertainty about the future is further compounded by the harsh realities of life in Khulna City. Overcrowding, poor housing conditions, and the lack of social support networks leave migrants feeling isolated and vulnerable. A 41-year-old female migrant explained,

> *"People tell me that I'm safe in the city, but it doesn't feel like home. I don't have any family here, and I feel like I'm just waiting for something bad to happen. I don't know what's next for me, and that uncertainty keeps me awake at night."*

This sense of hopelessness and anticipatory anxiety becomes a constant companion for migrants, leading to mental health deterioration over time. As they navigate their new urban environment, many migrants struggle to find any sense of stability or permanence, further deepening their feelings of liminality. Liminal anxiety also creates a sense of disconnection from both their rural past and their urban present. Migrants are neither fully part of the rural communities they left behind nor able to fully integrate into the city they now inhabit. The absence of community ties and familiarity with their surroundings leaves migrants feeling alienated, which contributes to social isolation and psychosocial distress. One participant, a 29-year-old male migrant, reflected,

> *"I'm caught between two lives. The place where I came from doesn't exist anymore, and here in the city, I feel like a stranger. I don't know where to turn for help, and I don't feel like I belong anywhere."*

These feelings of alienation and displacement often translate into long-term psychological struggles, further highlighting the importance of addressing the psychosocial aspects of climate migration.

5. Discussion

This study sought to explore the mental health impacts of climate migration in Khulna City, focusing on the challenges climate migrants face in adapting to urban environments. The findings from the qualitative interviews and focus group discussions clearly highlight the profound psychosocial stress experienced by migrants in Khulna, which is closely linked to both urban adaptation challenges and the emotional toll of forced migration. The first major finding of this study is the overwhelming emotional distress that climate migrants face upon relocating to Khulna. The loss of their homes, livelihoods, and familiar environments has resulted in significant psychological trauma. Many migrants expressed deep grief, with one participant stating, "Leaving my farm, my home, was the hardest thing I've ever done. I keep thinking about it every day. I feel like part of me is still there, stuck in the mud and the water." This sentiment reflects a common experience among climate migrants, where the emotional impact of place attachment loss and ecological grief becomes central to their mental health challenges. These emotional burdens are compounded by the uncertainty of their future in the city, as migrants often find themselves in a state of liminality, suspended between a lost rural past and an uncertain urban future.

The second key finding is the urban adaptation challenges that exacerbate the mental health risks for climate migrants. Overcrowded housing, poor living conditions, and limited access to basic services are common challenges that many migrants face in Khulna. The rapid urbanization of the city, while providing economic opportunities for some, has left migrants in vulnerable conditions, often in areas with inadequate infrastructure. One participant shared, "In the village, we had space, we had trees and fields. Now, in the city, I am stuck in a small room. There is no peace of mind. I miss the open spaces I used to have." These housing insecurities and lack of green spaces contribute significantly to the mental distress of climate migrants, as they feel disconnected from their past lives and overwhelmed by the demands of urban living.

The third important finding is the disconnect between climate adaptation policies and the psychosocial needs of climate migrants. While urban adaptation strategies in Khulna focus primarily on physical infrastructure—such as housing, sanitation, and transportation—there is a glaring gap in addressing the mental health needs of displaced populations. The psychosocial challenges faced by climate migrants, including anxiety, depression, and social isolation, are often overlooked in urban planning as migrants struggle to adapt to life in an unfamiliar city while coping with the loss of their homes and communities. In line with these findings, it is evident that mitigation and adaptation efforts must go beyond infrastructure development to incorporate psychosocial support into urban planning. Urban policies need to address the mental health challenges of climate migrants by integrating green spaces, community-building programs, and psychosocial services into the urban framework. The lack of these critical components in Khulna's urban policies creates an environment where migrants face psychological distress without adequate support systems to help them cope with the challenges of displacement and urban adaptation.

This study's findings align with broader research on climate migration and mental health, highlighting that the psychological impact of migration extends far beyond the immediate physical relocation. Migrants are not just displaced from their homes; they are displaced emotionally, with long-term mental health consequences that often go unaddressed in policy framework. Migrants in Khulna City, particularly those who have been living in the city for extended periods, continue to experience solastalgia—the distress caused by the environmental degradation of their home regions—and struggle to find a sense of belonging in the urban environment. The emotional burden of this dislocation and loss significantly affects their mental well-being and makes the process of adaptation to urban life even more difficult. The study suggests that there is an urgent need for more holistic urban adaptation policies that include the mental health of climate migrants as a central component. Urban planning must not only focus on the physical infrastructure but also on creating environments that facilitate the psychosocial well-being of migrants, such as through the development of community centers, social networks, and support systems that can help migrants adjust to their new lives. The integration of mental health services into the urban adaptation framework will be critical in improving the resilience of climate migrants in cities like Khulna.

6. Conclusion

This study explored the mental health impacts of climate migration in Khulna City, with a particular focus on the adaptation and mitigation challenges faced by climate migrants. The findings highlight the

profound psychosocial stress experienced by migrants, which is closely tied to both the urban adaptation challenges and the emotional toll of forced migration. Climate migrants in Khulna City often face a combination of physical and psychological hardships as they attempt to rebuild their lives in an unfamiliar urban environment. One of the primary conclusions drawn from this study is that climate migrants experience significant emotional distress due to the loss of place attachment and displacement trauma. The emotional toll of leaving behind their homes, communities, and livelihoods results in a range of psychological issues, including grief, anxiety, and depression. Many migrants expressed deep sorrow for the loss of their ancestral homes, with the emotional impact of this loss lingering long after their physical relocation. These emotional burdens are compounded by the uncertainty of their future in the city, as migrants often find themselves in a state of liminality, struggling to adapt to their new urban reality.

The study also found that urban adaptation challenges significantly contribute to the mental health risks faced by climate migrants. Overcrowded housing, inadequate living conditions, and limited access to essential services such as healthcare and clean water were common challenges for many migrants. These issues are particularly evident in the migrant-heavy wards of Daulatpur, Khan Jahan Ali, and Aranghata, where the growing population has placed a strain on existing infrastructure and social services. The lack of green spaces and overburdened public services exacerbate the mental distress of migrants, as they often feel disconnected from their previous lives and overwhelmed by the demands of urban living. Another critical finding of this study is the disconnect between climate adaptation policies and the psychosocial needs of climate migrants. While urban policies in Khulna focus primarily on physical infrastructure, such as housing and sanitation, there is a significant gap in addressing the mental health needs of displaced populations. Many migrants expressed frustration with the lack of support for their emotional and psychological well-being, highlighting the urgent need for more integrated and holistic urban adaptation strategies. The psychosocial challenges of migration, including feelings of isolation, hopelessness, and anxiety, are often overlooked in urban planning, yet they are central to the adaptation process for climate migrants.

The findings of this study suggest that climate migration should not be viewed solely as a physical displacement but as a complex psychosocial process that requires a more comprehensive approach to adaptation. Mental health must be a key consideration in future urban adaptation and mitigation strategies. The integration of psychosocial support systems, community-based programs, and green spaces into urban planning will be critical in helping climate migrants adapt to life in the city. By creating environments that promote psychological resilience, social cohesion, and well-being, cities can better support the emotional recovery of migrants and help them rebuild their lives with a sense of security and belonging. This study also emphasizes the importance of social networks and community support in the adaptation process. Many migrants expressed a longing for the social ties and support systems they had in their rural communities. As one participant explained, “In the village, we always helped each other, but here, I feel alone.” Building social networks and encouraging community integration in urban environments will help climate migrants feel more connected and supported in their new surroundings. This is particularly important in Khulna, where overcrowding and lack of social services make it difficult for migrants to feel at home.

The research highlights that climate migration is not just an environmental or economic issue, but also a psychosocial challenge. The mental health of climate migrants is often overlooked in urban planning, yet it is a critical component of the adaptation process. Urban policies must address both the physical and psychological needs of climate migrants to ensure their successful integration into urban life. This study advocates for more inclusive and resilient urban adaptation strategies that recognize the interconnectedness between climate migration and mental health. The findings from this research will inform future policies and provide a roadmap for cities facing similar challenges as they strive to create compassionate and supportive urban environments for climate migrants. Future research should explore the long-term mental health impacts of climate migration, particularly as migrants spend more time in urban environments. Longitudinal studies could help track how psychosocial stress evolves over time and whether current urban adaptation strategies are effective in addressing the mental health of displaced populations. Additionally, exploring the gendered dimensions of climate migration would provide deeper insights into the specific challenges faced by women and other marginalized groups within migrant communities.

CRediT authorship contribution statement

Khondoker Mahmud Parvez: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Software, Validation, Visualization, Writing – original draft, Writing – review & editing. **Rabita Hasan:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Ibrahim Mahmud Rushdi:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Data availability

No data was used for the research described in the article.

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