

A COMPREHENSIVE EXPLORATION OF THE SOCIAL AND CULTURAL DIMENSIONS OF CLIMATE MIGRATION: A REVIEW

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ABSTRACT

Climate change presents unprecedented challenges to societies, ecosystems, and cultures, leading to climate-induced migration where people and communities migrate as a result of environmental disruption. This phenomenon disproportionately affects vulnerable populations, including low-income groups, indigenous peoples, women, and marginalized communities, who are exposed to heightened levels of displacement and exploitation. While there is a growing recognition of climate migration, there exists a substantial gap in understanding its social and cultural dimensions. The current scholarly research mainly addresses economic and environmental concerns, more commonly excluding cultural heritage and community resilience components that are vital for sustainable adaptation. The review follows a systematic process of gathering evidence from peer-reviewed journal articles, policy briefs, and case studies published between 2003 and 2023. The data was obtained from credible academic databases, including ScienceDirect, JSTOR, and Google Scholar. Thematic analysis was used to extract major trends, policy frameworks, adaptation strategies, and governance responses that respond to climate migration. The study highlights how communities adopt various adaptation strategies, ranging from local initiatives to global support systems, to mitigate the adverse effects of climate migration. Responsibility-sharing, good governance, and cultural preservation, however, become imperative in promoting resilience and aiding recovery. Policy reactions that range across the continuum, in tandem with cooperative governance and adaptive strategies, are needed to address climate migration. Through an examination of climate projections, population dynamics, and socioeconomic realities, this review highlights the potential for innovation and collaboration. A mutual responsibility approach can enhance resilience and preserve dignity in a changing climate at an ever-increasing rate.

KEYWORDS: *climate change, climate migration, social dimensions, cultural dimensions, vulnerability*

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1. INTRODUCTION

Climate change has brought a lot of trouble to societies, ecosystems and cultures round the world. As temperature rises, extreme weather events become unprecedentedly common, and the sea level rises; the most apparent impact will be on animal communities, including humans. Climate migration, which had been produced mostly as a result of most changed consequences by climate change like land transformation, was one of the effects felt the most. It happens to individuals, families and entire communities due to damage and environmental disruptions caused by most of the time-abandoned places (Malhi et al., 2020; Weiskopf et al., 2020). Absorbing these complexities will provide knowledge on developing policy responses and social resilience with regard to vulnerable populations in successfully addressing the impacts which are culturally and socially induced by climate change.

Thus, this review article is a detailed study on climate migration in its social and cultural aspects, taking into consideration the challenges faced, responses given, and policies that prove necessary in such a multifaceted phenomenon. With those objectives in mind, it first delves into the concept of climate change, providing an overview of its definitions, typologies and underlying drivers. These include, but are not limited to, sea-level rise, drought, and extreme weather events, all of which contribute to the displacement of people and alter human geographies while challenging existing ideas of place and belonging (Askland et al., 2022). That is the way we should see, too, the very profound social impacts that those changes have on communities and cultures: from changes in livelihoods and the displacement of indigenous peoples to the loss of their cultural heritage and social cohesion, climate-induced migration restructures societies, often accentuating their existing disparities and vulnerabilities (McMichael, 2023). Moreover, such populations as low-income communities, indigenous peoples, women, children and marginalized groups remain vulnerable to different impacts of climate change. Likewise, the issues of environmental justice and human rights are relevant in addressing the disproportionate burdens borne by these populations and ensuring that

responses to climate-induced displacement are equitable (Abi Deivanayagam et al., 2023).

In response to the challenges posed by climate change, communities and societies have adopted a variety of strategies and adaptation methods. In light of the climate crisis, communities and societies are employing numerous strategies and adaptations. From community-level methods to transnational support networks, resilience-building work aims to diminish the negative impacts of climate-induced displacement while creating pathways for sustainable development (Adger et al., 2003; Karimi et al., 2023). Nevertheless, a response to climate change requires robust policy frameworks and governance systems at local, national and international levels. In this context, by considering frameworks already in place to respond to climate change and migration, including protection for refugees, disaster risk reduction and the Sustainable Development Goals, we can identify opportunities to strengthen resilience and equitable outcomes for these communities. Furthermore, ethical issues concerning climate change, particularly responsibility-sharing, equitable burden-sharing and the rights of those displaced, are pertinent (Dowd & McAdam, 2017). Cultural resilience and the maintenance of cultural heritage also play a vital role in enabling adaptation and recovery processes in responses to environmental shocks (Oliver & Morecroft, 2014). Finally, it is useful to think about the climate projections, demographic trends, socio-economic drivers and policy reactions when pondering future climate change scenarios and pathways. Therefore, this review article seeks to provide a comprehensive understanding of the social and cultural impacts of climate change and the challenges, responses, and policy considerations needed to address this complex and urgent issue in the 21st century.

2. METHODOLOGY

This study examines what has been written about climate migration, focusing on materials published from 2003 to 2023. These include journal articles, policy reports, and case studies, offering both historical and current insights. The researchers used databases like Google Scholar, JSTOR, and

ScienceDirect, searching with terms such as “climate migration,” “environmental displacement,” “cultural impacts of migration,” and “climate resilience strategies.” They selected studies that discuss the social and cultural aspects of climate migration, excluding those lacking strong evidence or not fitting the geographical focus. In total, 85 papers were reviewed for their relevance and evidence.

The study used qualitative analysis to find trends, policy frameworks, adaptation strategies, and challenges for those forced to move. This helps avoid bias and gives a balanced view of climate migration. Communities use various strategies to cope with climate-induced displacement, like local solutions and global support networks. Addressing climate migration needs strong policies and governance on multiple levels. It is crucial to share responsibilities fairly and protect the rights and culture of displaced people, vital for helping them adapt and recover.

There are some limitations. The study might be biased as it relies on specific databases, possibly missing some viewpoints. Even though the researchers sought diverse sources, regional differences in research might affect findings. More studies are necessary to confirm observed trends and policy impacts.

This paper highlights opportunities for innovation and cooperation towards a resilient future, considering climate impacts, population changes, and economic factors. Tackling climate migration needs collective effort to address climate change causes, reduce economic vulnerabilities, and ensure fair development. Recognizing shared responsibility can help secure a dignified future for everyone in our changing climate.

3. RESULTS

3.1. Understanding climate change

Climate change refers to a long-term change in temperature, precipitation, wind, and other aspects of the Earth's climate system. This situation is primarily caused by human activities, fossil fuel combustion, deforestation, and industrialization, which are responsible for increased emissions of greenhouse gases (GHGs). According to research conducted by the Intergovernmental Panel on Climate Change (IPCC), global temperatures have increased by about

1.1°C compared to pre-industrial times as a result of rising atmospheric carbon dioxide (CO₂) and methane (CH₄) concentrations (IPCC, 2021). An increase in global temperatures has increased climate variability and caused more climate-related disasters to occur, with greater severity.

One of the most significant effects of climate change is the increase in extreme weather events. The World Meteorological Organization (WMO) noted that the last decade has experienced an unprecedented level of climate-associated disasters, such as extreme heat, hurricanes, floods, and wildfires (WMO, 2021.) For example, the Australian bushfires in 2020 burned more than 18 million hectares, destroyed thousands of homes, and displaced multiple communities. The severe floods in Pakistan in 2022 affected over 33 million people and forced millions from their homes, due to infrastructure destruction and loss of agriculture (UNHCR, 2022.) These extremes of weather have a significant impact on vulnerable communities, who are often left with no choice but to migrate.

The term climate migration can be described simply as the movement or relocation of people or populations from one geographical place to another because of climate change. It is a complicated issue with multiple environmental, social, economic, and political drivers (Vlassopoulos, 2013). It is common to see climate migration used alongside phrases such as climate refugees and environmental migrants, which can refer to different motivations or contexts of migration. Climate migration can refer specifically to slow-onset environmental drivers, and disasters that happen abruptly (fast-onset events) (Piguet, 2013).

According to the Intergovernmental Panel on Climate Change (IPCC) definition, climate migrants are people who are forced to leave their environment temporarily or permanently as a result of changes to their environment, either slowly or suddenly. Such changes include sea level rise, climatic variability resulting in extreme weather phenomena, as well as drought and water stress (Leal-Arcas, 2012; Meze-Hausken, 2000). In Bangladesh, for example, coastal land erosion has displaced thousands of people along the coast. Such displacement is particularly prevalent in areas of high intensity of coastal land erosion, such as Khulna and

Barisal, due to increased erosion and saltwater intrusion into areas where previously sustainable livelihoods were possible (Ahmed et al., 2019). Similarly, in sub-Saharan Africa, increased droughts have led to out-migration from arid areas like the Sahel to urban centers putting additional pressure on already emerging urban settings that could fail to sustain the increased migrants (Rigaud et al., 2018).

Climate migration can be categorized by when and how environmental changes occur. Slow-onset events, such as gradual sea level rise, desertification, and long-term change in precipitation patterns can lead to gradual displacement and migration. The Maldives faces existential threats as projections show rising sea levels submerging large portions of the island nation by the end of the century, resulting in forced migration at a national scale (Klepp, 2017). Sudden-onset environmental events, such as hurricanes, rapid flooding, or wildfires, commonly lead to disorganized mass migration. For example, the 2010 earthquake in Haiti coupled with hurricanes has created thousands of migrants seeking refuge in other countries (IOM, 2018).

To inform policymakers and decision-makers to come up with mitigation strategies and policy interventions, it is important to understand the different categories of climate migration. As climate change changes landscapes, economies, and societies, proactive planning to mitigate climate migration will be ever more important. Climate migration will require international cooperation and increased resilience-building strategies, and policies to support those displaced and lessening the socio-economic costs of forced migration.

3.2. Factors influencing climate change-related climate migration

Several factors contribute to climate change-related climate migration (Connell, 2015; Kang et al., 2009; El Kharraz et al., 2012), some of which are specified below and illustrated in Figure 1.

In addition to the environmental factors, socio-economic vulnerability, political instability, limited adaptive capacity, and lack of infrastructure all

exacerbate the effects of climate change, often leading to migration (Warner et al., 2010; Ebi et al., 2021).

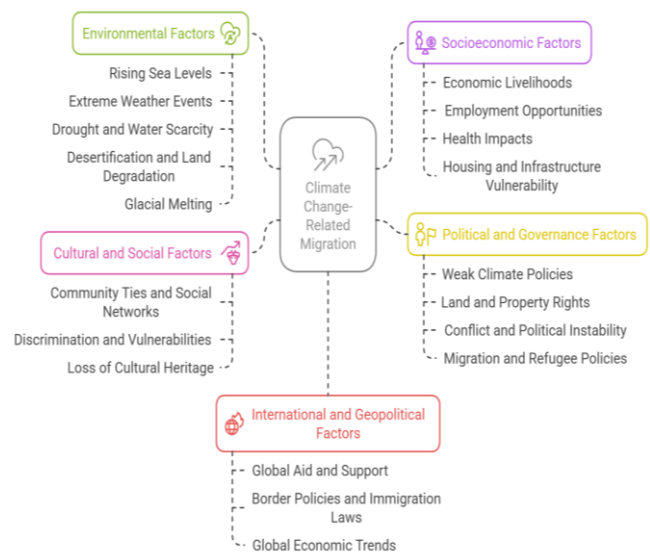


Figure 01: Factors influencing climate change-related climate migration

However, these factors are not only factors, they are also outcomes of climate change, as they are often made worse by extreme weather events and ongoing environmental degradation. Solutions to the drivers of climate change must be viewed through an integrated or systemic way with respect to climate adaptation, disaster risk reduction, poverty alleviation, and social justice (Bell et al., 2018). This approach requires coordinated action at the local, national, and international levels to tackle these linked challenges. Therefore, understanding climate-related migration ultimately requires an understanding of the complexities of the relationships between environmental change, socio-economic processes, and human mobility (Robinson, 2021). By investigating the complex drivers and consequences of climate-related displacement, policymakers and other stakeholders can formulate meaningful projects for reducing risk, building resilience and supporting the rights and wellbeing of affected communities (Parrish et al., 2020; Schwerdtle et al., 2020). Furthermore, proactive policies designed to enhance community resilience and adaptive capacity can play a significant

role in reducing forced migration and promoting sustainable

3.3. Impacts on Communities and Cultures

Changes in climate often affect traditional livelihoods and economic activities, especially for rural and agricultural communities that rely on natural resources (Thomas & Twyman, 2005). Displacement due to environmental degradation such as drought or inundation leads to loss of land, lower crop yield, and reduced access to water and food. This can result in affected communities attempting new sources of income, moving to urban areas, or employing non-traditional livelihoods. Adjustments to livelihood strategies can have broad reaching socio-economic implications, such as an increase in poverty, inequality, and vulnerability to exploitation (Warner et al., 2010).

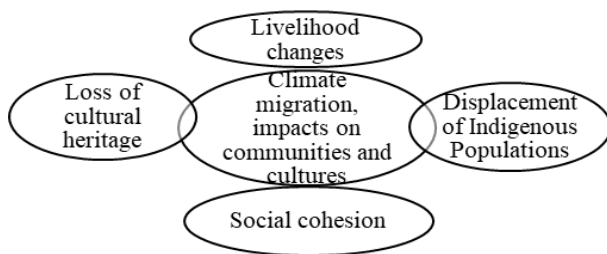


Figure 02: Climate migration, impacts on communities and cultures

Climate change can impact traditional livelihoods and economic practices, notably in rural and agricultural settings where communities depend directly on natural resources (Thomas & Twyman, 2005). Environmental displacement as a consequence of climate change, such as drought and flooding, leads to loss of land, decreased crop yield and limited access to food and water which in conjunction can lead to affected communities either seeking new opportunities for income, migrant to urban communities, or adopting a non-traditional livelihood. Livelihood shifts can result in significant socio-economic repercussions such as an increased prevalence of poverty, inequality, and a greater risk of exploitation (Warner et al., 2010). Indigenous communities are disproportionately impacted by climate change due to their deep

relationship to the land, reliance on traditional subsistence practices, and their repeated lack of inclusion in climate-related decision-making. Climate-driven environmental change threatens their territories, cultures, and livelihoods, which often hinders long-standing traditions, and encourages forced displacement from traditional lands. Forced displacement can result in custom governance systems being disrupted and cultural ties losing their power, exacerbating historical injustice (Norton-Smith et al., 2016; Tsosie-Paddock, 2018).

Climate-induced migration poses a very real threat to cultural heritage, specifically tangible and intangible forms of cultural practice, knowledge, and identity. Rising sea levels, increased frequency of extreme weather, and other forms of environmental degradation can damage or completely eliminate sacred sites, archaeological artifacts, traditional habitats, and cultural landscapes. The displacement of communities as a result of climate migration also contributes to the erosion of linguistic diversity and disrupts the intergenerational transfer of cultural knowledge and practices. Cultural heritage loss diminishes cultural diversity, disrupting community resilience, identity, and sense of belonging (Aktürk & Lerski, 2021; Kim, 2011).

Climate migration can disrupt social cohesion within and between communities, as displaced populations face challenges related to resettlement, integration, and pressures for resources. Displacement may lead to social rupture, heightening population stress, cultural challenges, and resource scarcity in receiving communities (Heslin et al., 2019). Furthermore, growing loneliness, feelings of alienation, and distrust as communities' experience loss of social networks, community attachments, and collective identities may also compromise social cohesion and resilience. However, as a result of displacement, community-led responses, deliberative governance systems, and cultural practices can lead to cooperation, social connection, and greater flexibility, which develop social cohesion and recovery over time (Kuhn et al., 2017).

Therefore, climate change presents considerable impacts on communities and cultures by altering ways

of being, displacing Indigenous peoples, endangering cultural heritage, and disrupting social cohesion. Attention to the social and cultural dimensions of climate-related displacement is vital to create equitable responses, protect cultural diversity, and assist the ability of communities to be socially and culturally engaged in response to changing environmental situations. Owing to the complex intersections related to transitions to climate responsive policies and practices, policymakers, practitioners, and communities are able to advance development pathways that engage and support human rights, cultural identity, and social equity (Pearson, et. al, 2022).

3.4. Differential impacts of climate migration on vulnerable populations

Due to multiple reasons, including socioeconomic conditions, scarcity of resources, and systemic inequities, climate migration has a disproportionate impact on vulnerable populations, including low-income communities, Indigenous peoples, women, children, and other marginalized groups. Understanding the effects of climate change on these populations demonstrates a complex interplay of inequalities in exposure, vulnerability, and adaptive capacity, highlighting questions of environmental justice and human rights (Levy & Patz, 2015; Otto et al., 2017). For example, low-income communities frequently lack the resources or infrastructure needed to adapt to climate change impacts and/or to migrate to a more secure area. Additionally, they are more likely to live in hazardous zones such as floodplains or coastal areas where infrastructure, housing, and services are inadequate. Empirical studies have shown that marginalized communities are often displaced following extreme weather events, such as Hurricane Katrina, where lower-income and Black communities in New Orleans faced significant challenges in evacuation, recovery, and relocation (Bullard & Wright, 2009). Climate displacement can further exacerbate existing social conditions and vulnerabilities, leading to greater poverty, homelessness, and health risks that confront these populations (Ayers, 2012).

Indigenous peoples are among the most susceptible to climatic change due to their reliance on subsistence economies, i.e., agriculture or fisheries, and their close connection with the climate. The climate change-related risk of displacement not only removes them from their ancestral territories, which in most instances are the very source of their cultural potency, but also potentially annihilates their spiritual connection with the land, in addition to their traditional way of life. For instance, the Inuit communities in Alaska have been hit hard by the thawing of permafrost, to the extent that entire villages like Shishmaref and Kivalina have been considering relocation (Marino, 2015). In most instances, Indigenous peoples have limited access to legal recourse and resources that may reduce their vulnerability to climate change, forced migration, or social exclusion (Ford et al., 2020). Furthermore, the United Nations Permanent Forum on Indigenous Issues (UNPFII) has reported the accelerated deforestation and climate-induced land encroachment encountered by Indigenous peoples in the Amazon region, which jeopardizes their livelihood (UNPFII, 2019).

Because of unequal gender roles, women will be more affected by climate migration. Gender inequalities restrict girls' and women's access to assets, their decision-making power, and their mobility, making them even more vulnerable to climate change. Women and girls perform the majority of caregiving and domestic tasks, and this also makes them more susceptible to problems like lack of food, water shortages, or additional health risks as a consequence of climate change. Climate catastrophe studies project that women die more than men in weather-related catastrophes because of social constraints on mobility. This was observed when women died three to four times more than men during the 2004 Indian Ocean tsunami (Neumayer & Plümper, 2007). Climate-induced migration also exposes women and girls to gender-based violence, exploitation, and sex trafficking. The United Nations High Commissioner for Refugees (UNHCR) has noted that displaced girls and women consistently experience increased amounts of gender-based violence in temporary settlements and refugee camps due to the absence of security and their

lack of sufficient legal protection (UNHCR, 2018; Goldsworthy, 2010; Goh, 2012).

Children are especially vulnerable to the impact of climate change and displacement; they rely on adults for safety, security, and care. Displaced conditions may heighten some of their existing vulnerabilities, difficulties accessing educational, medical, and social services. The floods of Pakistan, in 2010, displaced millions. It has been estimated that approximately 3.5 million children were affected and are suffering from malnutrition, disease outbreaks, and disrupted schooling (UNICEF, 2010). Children from marginalized communities may find extra challenges in accessing safe shelter, clean water, and sufficient nutrition, which put their well-being and development in jeopardy (Thomas & Thomas, 2004; Lane et al., 2013). More research has shown that climate change is linked with increased anxiety and post-traumatic stress disorder (PTSD) in such displaced children (Burke et al., 2018).

Ethnic minorities, refugees, and LGBTQ (Lesbian, Gay, Bisexual, Transgender, Queer (or Questioning)) people face discrimination and exclusion that make them more vulnerable to climate-related displacement (Paul & Suresh, 2024). These groups often struggle with unfair obstacles to legal protection social services, jobs, and resettlement. Research shows that refugee policies often don't help LGBTQ individuals who are persecuted in both their home countries and where they've been displaced putting them at higher risk of violence and poverty (McAdam, 2012). Unfair practices and policies can push marginalized groups further away creating a cycle of poverty, inequality, and social injustice. For instance, reports show that minority communities in Bangladesh are often cut off from emergency aid, which makes their climate-related vulnerabilities even worse (Rahman & Alam, 2016).

Worries about environmental fairness and human rights play a key role when we deal with how climate change affects vulnerable groups differently (Adger 2001). Environmental fairness demands that we share the good and bad parts of the environment, give a voice to overlooked communities in making choices, and make sure people can get what they need to adapt

and bounce back. The Paris Agreement has stressed the need for climate fairness putting focus on guarding human rights and the rights of Indigenous peoples in plans to adapt to climate change (United Nations Framework Convention on Climate Change, 2015). To protect the dignity and rights of those forced to move due to climate, we must uphold human rights principles. These include the right to live, to be safe, to have shelter, and to be treated. This calls for broad plans that tackle the root causes of danger, push for growth that includes everyone, and help affected communities stand strong against climate change (Atapattu 2020; Bustos & Vélez-Echeverri 2023; Naser 2013).

3.5. Responses and coping strategies

Communities and societies facing climate-driven migration use various strategies to lessen the effects of displacement and build resilience (Barnett & Webber 2010). These approaches include steps to adapt, community-led efforts safeguarding culture, and support networks across borders to tackle the consequences of migration due to climate change (Figure 3).



Figure 3: Resilience cycle for climate-induced migration

Communities experiencing climate-related migration often adopt adaptation strategies to lessen the impacts of the environment. Adaptation strategies may involve building infrastructure that can withstand hazards, developing early warning systems for natural hazards, diversifying livelihoods, and promoting sustainable land and water practices (Thomas & Benjamin, 2018). Local communities are fundamental in forming and implementing measures to manage migratory responses to climate change. Community-based initiatives best aim to increase community resilience by restoring ecosystems, promoting sustainable agricultural practices, emergency preparedness training, and establishing community-run natural resource management systems (Roka, 2020). Climate-induced migration can impact affected communities' cultural heritage and identity. To maintain both their cultural traditions and knowledge, these communities can develop ways to safeguard and record traditional practices, languages, rituals, and local forms of knowledge. Efforts to perform cultural preservation works not only preserve community cohesion but can strengthen resilience from the increased social capital derived from community and network ties (Kohsaka & Rogel, 2021).

When people move to another country because of climate change, they often join communities that cross borders. These communities offer valuable help by giving resources, information, and services to both migrants and the local people who welcome them. Various groups, such as non-government organizations, international bodies, and community networks, work together to support these migrants. When these support networks effectively bring together people from different places and cultures, they can help everyone better manage the challenges that come with climate migration.

Governments and rule-makers play a vital role in helping communities cope with the challenges of climate-induced migration. They can establish laws to safeguard the rights of individuals who relocate due to climate shifts. Moreover, they can allocate funds to aid communities in welcoming and adjusting to new residents. Encouraging sustainable development is also crucial; it means expanding in ways that respect and protect the environment. Additionally,

international cooperation is essential to combat climate change effectively. These actions support both newcomers and existing communities in adapting to significant changes.

Understanding the reasons behind climate-related migration, its effects, and the underlying dynamics is essential for developing effective solutions (Thomas & Benjamin, 2018). Research institutes, academic bodies, and civil society groups can contribute by conducting studies, gathering data, and sharing knowledge and best practices. These efforts lead to evidence-based decision-making and collaborative strategies, which strengthen responses to climate migration issues (Cane et al., 2013).

To address the issues of people relocating due to climate change, we need a full plan. This plan should include ways to help people adjust to new conditions. We must support local projects, protect cultural traditions, and build connections with other countries. It's also important to have strong policies and share research and knowledge. By working together, communities can better manage the movement of people, lessen any negative effects, become more resilient, and help with sustainable development during climate change (Naser et al., 2019).

3.6. Navigating Climate Migration: Comprehensive Policy Frameworks and Governance Mechanisms

3.6.1. Local Level

Cities are now planning better to manage people moving due to climate change. This involves setting rules for how land is used, constructing roads, creating infrastructure, and gathering people to build stronger communities. These efforts help address issues like floods, rising sea levels, and severe weather. Local communities are crucial in dealing with these movements. Community-based adaptation is about helping communities come up with their own solutions to the impacts of climate change and supporting those who need to move. It empowers them to create and carry out strategies to tackle these challenges (Collins, 2013).

3.6.2. National Level

Many countries have developed National Adaptation Plans, or NAPs (National Adaptation Plan), to outline

their approaches to climate change. These plans include strategies for dealing with people relocating because of climate change (Mombauer et al., 2023). Some countries have introduced specific laws for those forced to move due to climate-related reasons, which are distinct from other types of relocation policies. These laws often outline government support and protection for climate refugees (Butros et al., 2021). Furthermore, many national governments have put in place Disaster Risk Reduction, or DRR, strategies. These are designed to lessen the damage caused by climate-related disasters and aim to reduce the necessity for people to move away when such disasters occur (Collins, 2013).

3.6.3. International Level

The United Nations Framework Convention on Climate Change (UNFCCC) offers a forum for international cooperation on climate change, which includes discussions on climate-induced migration. Under the UNFCCC, the Paris Agreement highlights the significance of addressing climate-induced displacement and calls for improved cooperation and support for vulnerable states. The Global Compact on Safe, Orderly and Regular Migration (GCM), which was adopted in 2018, is the first intergovernmental instrument to cover all dimensions of international migration, including forced and voluntary migration. Furthermore, although the GCM does not focus exclusively on climate migration, it presents a basis for addressing the challenges of migration, including migration caused by climate change. Finally, the International Organization for Migration (IOM) plays an integral role in helping migrants, including people displaced as a result of climate change. The IOM works with governments, NGOs, and other actors to confront the challenges posed by climate-induced migration and pursue sustainable solutions. Although it is not specifically referring to climate migration, the Global Compact for Migration (GCM) contains a wide range of content about migration, including displacement due to environmental factors. The GCM encourages countries to work together to manage migration and promote the rights of migrants (Pécoud, 2021; Khadria et al., 2019). Climate migration should ultimately be addressed through a multi-level governance approach that encompasses climate

adaptation, disaster risk reduction, refugee protection and sustainable development goals, in a collaborative way amongst local communities, national governments and international organizations in order to develop and implement supporting and facilitating policies and mechanisms (Crnčević & Orlović Lovren, 2018).

3.7. Ethical Imperatives and Cultural Resilience

In today's world, climate change is becoming a bigger problem. This is causing more people to leave their homes because of environmental changes and severe weather. It raises important questions about who is responsible and how to make sure people are treated fairly (Ghosh & Orchiston, 2022). Ethical ideas suggest that all countries should help bear the burden for those affected. Countries that have released more greenhouse gases in the past should take on more responsibility to help people who have been displaced. Additionally, it is crucial to preserve cultural traditions as part of managing moves related to climate issues (Figure 4).

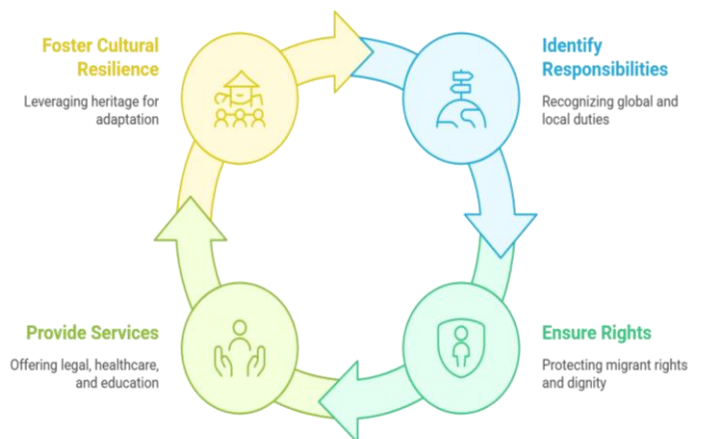


Figure 4: Cycle of Ethical Support and Cultural Resilience

When people have to leave their homes because of climate change, there are important questions about who should help them and how to do it fairly. There is an idea called "common but differentiated responsibility," which is part of global climate agreements. It means richer countries, who are responsible for most of the pollution, should do more

to help solve climate change issues and support the people most affected by them. Fairness means sharing the costs and responsibilities of migration equally among countries and communities (Khare, 2016; Petri & Biedenkopf, 2020). Climate migrants, those who move due to climate change, face many difficulties. They have rights, like asking for asylum, finding decent housing, and having the chance to work. It's crucial to protect these rights and treat these individuals with respect and dignity during their moves. This involves providing them with legal help, healthcare, education, and other necessary services. It's also important to fight against any discrimination and unfair treatment they might face (Barnett & Webber, 2010; Mayer, 2011).

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Cultural resilience includes the consideration for valuing and leveraging cultural heritage to bolster the capacity of communities to adapt and recover from climate-related displacement. Effective policies and interventions should acknowledge and incorporate ethical considerations and cultural understandings into

support for community resilience to climate change and well-being.

3.8. Future scenarios and pathways

When considering future scenarios and pathways for climate migration, a variety of factors must be accounted for, including the projected impacts of climate change, demographic changes, socio-economic drivers and policy responses (Smirnov et al., 2023). Below are example future scenarios and pathways, as well as opportunities for innovation, collaboration and transformative change (Figure 5).

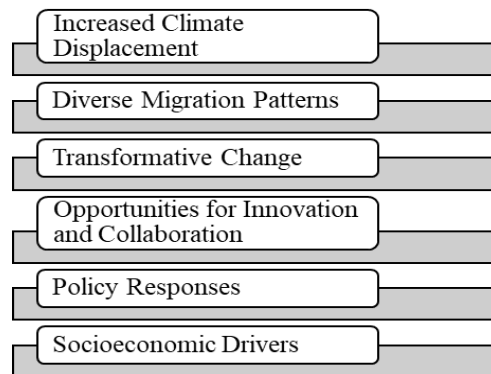


Figure 5: Some potential future scenarios and pathways

As global warming continues, climate-related disasters like extreme weather, ocean-level rise, and food insecurity are predicted to increase in frequency. This impact could result in climate-induced displacement of potentially millions of people from their homes by the middle of the century. Those areas vulnerable to climate change, including low-lying coastal locations, small island states and arid areas, are likely to be affected most (Kumar et al., 2018). Climate migration is not likely to take one form and will depend on the climate impacts in a region, socioeconomic context and policy responses to the effects of climate change. Some communities may be compelled to leave their home due to sudden-onset disasters, while other communities may witness slow-onset disasters prompting the gradual movement of people away from the environment. Internal migration within a country or migration across national borders may increase due to climate-related stressors (Warner et al., 2010). Socioeconomic variables such as poverty, inequality or conflict may combine with climate impacts to shape

patterns of migration (Brzoska & Fröhlich, 2016). Socioeconomically vulnerable populations with few resources or limited livelihood options will be particularly impacted and have the most difficult time adapting to climate changes and relocating. Addressing the underlying socioeconomic drivers through poverty reduction, social protection, and inclusive development strategies will be critical to decreasing vulnerability to climate-induced displacement (Jayawardhan, 2017; Aleksandrova & Costella, 2021). Governments, international organizations, as well as civil society actors have begun to recognize the need for coordinated policy responses to climate migration. This includes improving climate resilience, strengthening disaster risk reduction, protecting displaced persons, and facilitating planned relocation as needed. Policy frameworks like the Global Compact on Safe, Orderly, and Regular Migration and the Sendai Framework for Disaster Risk Reduction offer important guidance in addressing climate migration at the national and international levels (Stojanov et al., 2021; Barnett & Webber, 2010). Addressing climate migration will require innovative responses and collaboration across sectors and stakeholders. There are opportunities for innovation in developing climate-resilient infrastructure, sustainable land-use planning, and ecosystem-based adaptation and early warning systems of climate-related hazards. Collaborative approaches across governments, communities, researchers, and the private sector can leverage expertise and resources to develop and implement effective strategies for adaptation and migration (Booth et al., 2022; Waddell, 2017). In order to respond appropriately to climate migration, transformative change will need to occur at multiple scales. This will mean moving towards development pathways that are low-carbon and climate-resilient while advocating for social equity and justice, and ensuring that there is collaboration and solidarity at the global level. Transformative change will require political leadership, public interest, and sustained advocacy towards addressing the root causes of climate change toward building a more resilient and sustainable future for all (Filho et al., 2022; Fazey et al., 2018). In conclusion, the scenarios and pathways we envision into the future related to climate

migration will be constructed by a complex interaction of climate impacts, population dynamics, socioeconomic drivers, and policy responses. While the challenges associated with climate migration are considerable, there will also be impetus for innovation, collaboration and transformative change to build more resilient communities and societies in the context of a changing climate.

4. CONCLUSION

To sum up, migration due to climate change raises a complex issue at the interface of environmental, social, economic, and political dimensions. It deeply affects communities and cultures, transforming what people do for a living, dismantling cultural legacies, and disrupting social cohesion. Vulnerable populations, such as members of low-income communities, one-time indigenous, women, children, and marginalized communities, experience a disproportionate amount of the negative impacts from migration and climate change, especially due to increased risk of displacement, poverty, and exploitation. Understanding the complexity and multifaceted effects of climate migration is an important start as trying to think about responses that respect human rights, support social justice, and capacity-building. To acknowledge the root causes of climate change, addressing climate migration requires comprehensive solutions that integrate climate adaptation, disaster risk reduction, poverty reduction, and participatory governance mechanisms. In thoughtful, equitable, and sustainable ways, addressing issues which often overlap is necessary for vulnerable populations and incorporated in policies and practices. Accomplishing these needs requires stakeholders from practice, policy, and community levels to work together to build resilient societies that respect cultural diversity, protect human rights, and enable everyone to live with dignity in the face of climate change. As such, responding to climate migration necessitates collective action to respond to root causes of climate change, reduce socioeconomic vulnerabilities, and support inclusive and sustainable development. By embracing this shared responsibility and seizing opportunities for collaboration and innovation, we can build a more resilient and equitable

future for all amidst the challenges of a changing climate.

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