# Climate Change, Migration and Social Vulnerability in Nepal

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## ABSTRACT

Climate change has become an everyday reality for many communities in Nepal, shaping livelihoods, mobility, and social wellbeing. This study examines the interconnections between climate change, migration, and social vulnerability, highlighting how environmental stress interacts with existing social inequalities. The study uses a thematic and comparative analytical framework to interpret. Drawing on entirely secondary data, the research adopts a conceptual and descriptive methodology, reviewing academic literature, government reports, and publications from national and international organizations covering the period from 1990 to 2025. The findings show that climate-induced hazards such as floods, droughts, landslides, and glacial melting increasingly disrupt rural livelihoods, prompting migration as a coping and adaptation strategy. However, migration also produces new forms of vulnerability, particularly for women, marginalized castes, and economically disadvantaged groups. The study argues that climate change in Nepal functions as a social as well as environmental challenge, reinforcing structural inequalities. It concludes that inclusive, migration-sensitive, and socially just adaptation strategies are essential for strengthening resilience in a changing climate.

***Keywords:*** climate change, migration, vulnerability, environmental stress, inequality

## INTRODUCTION

Climate change has led to significant global temperature increases and subsequent changes in rainfall patterns, sea-level rise, and storm surges, profoundly impacting

various socioeconomic sectors, especially agriculture (Rahman et. al., 2025). Climate change is no longer a distant threat, it is a reality that touches the lives of people around the world, and Nepal is no exception. In this country of soaring mountains, rolling hills, and fertile plains, the impacts of a changing climate are both visible and deeply felt. Glaciers (2023) are melting at unprecedented rates, rivers are swelling and flooding villages, and long dry spells are destroying crops that families rely on for survival. Nepal's peasantry has long been depicted as a socially static setting, largely engaged in subsistence farming and reliant on antiquated agrarian equipment (Bhandari, 2025, p. 86). For many Nepali communities, especially those living in remote areas or depending on subsistence farming, these environmental changes are not abstract statistics, they are daily struggles that threaten food security, income, and even life itself. The consequences of climate change are unevenly distributed, hitting the most vulnerable hardest, including women, elderly people, indigenous communities, and those already living in poverty. Understanding how climate change interacts with social vulnerability is therefore critical to creating solutions that protect lives, livelihoods, and the environment. Limited access to livelihood resources is frequently cited as a fundamental source of heightened vulnerability, and unequal policies and pat terns of sometimes very rapid development are benefiting certain segments of society while making others more vulnerable (Tucker et. al., 2015).

One of the clearest ways climate-change affects people in Nepal is through migration. Climate change exacerbates Nepal's exposure to environmental hazards like landslides, floods, and droughts, which degrade agricultural productivity and drive forced displacement, particularly from rural areas to cities and overseas (Baral, 2025, p. 13). When floods destroy homes or droughts ruin harvests, families often have little choice but to move in search of safety or better opportunities. Some migrate temporarily, working in cities or abroad to send money home, while others may leave their villages permanently. But migration is not just about escaping environmental stress, it is deeply tied to social, cultural, and economic factors. Who can move, where they go, and how well they survive in new places all depend on their social networks, economic resources, and sometimes even caste or gender. Change must be focused on equality (Shah, 2026, p. 9). striking the sources of injustice inherent in the allocation of resources and power through communities", While moving can provide hope and survival, it can also create new challenges, including insecure jobs, poor living conditions, and social isolation. Exploring the links between climate change, migration, and vulnerability can help us see both the opportunities and the hardships that migration brings for Nepali communities. Today's modern world, international labor migration has been made possible by increased globalization, which has brought

about greater flexibility in state policies and has been facilitated by better connectivity, either communication or transportation (Bhattarai K. , 2025, p. 170).

Nepal's vulnerability to climate change is shaped by more than just the environment—it is also a reflection of social and economic realities. The location of Nepal explains its contemporary challenges. Nepal has a landlocked geography and is exposed to myriads of vulnerabilities-geographical difficulties being among the prominent (Bhattarai D. , 2022, p. 10). Many communities rely heavily on traditional farming, often without modern technology or infrastructure to cope with unexpected weather events. Social inequalities, including gender discrimination and caste hierarchies, mean that some groups face greater challenges than others when dealing with climate shocks. For example, women-headed households may struggle more to access information or aid, while remote mountain communities may have fewer livelihood options, leaving them exposed to repeated hardships. Through the geographical dimension, Nepal is divided into three geographical areas - plains (Tarai), hills and Himalayas (Kafle, 2020, p. 161). Understanding these social dimensions is essential if we want to create policies and programs that truly help people adapt to climate change, rather than leaving the most vulnerable behind.

Migration caused by climate pressures also has ripple effects across Nepal. As global temperatures are breaking all records, sea rise is eroding space for coastal populations, and firenados have arisen across the globe to burn down habitable lands (Nagdev, 2024, p. 89). When people move to cities, towns, or even other countries, it can create pressures on housing, services, and social cohesion in the areas they move to. Due to the population pressure, low productivity, and difficult terrain of hills and mountains, people started to move from uphill to lower river basin, valleys, and Tarai region (Karki, 2024, p. 131). At the same time, the communities they leave behind may experience labor shortages, economic decline, and weakened social structures. Studying how climate change drives migration and how migration, in turn, reshapes communities helps us understand a cycle of adaptation and vulnerability. It also reminds us that migration is not just a problem to solve, it is a human response to the very real challenges people face every day. It advocates for environmental, political, and social equity (Dahal, 2024, p. 92).

This research aims to bring these interconnected issues into focus. While many studies have looked at climate change or migration separately, few have examined the way they intersect with social vulnerability in Nepal. By drawing on existing studies, reports, and statistics, this study explores how environmental changes influence human mobility and how social inequalities shape people's capacity to adapt. The

goal is to provide insights that can guide policymakers, development practitioners, and communities themselves in designing strategies that reduce vulnerability, strengthen resilience, and promote fair and sustainable solutions. In doing so, the research hopes to highlight not only the challenges Nepal is face in a changing climate but also their creativity, resilience, and determination to survive and thrive.

## METHODOLOGY

This study is conceptual and descriptive, aiming to explore the interconnections between climate change, migration, and social vulnerability in Nepal. Rather than conducting fieldwork or collecting new primary data, this research relies entirely on secondary sources. By synthesizing existing literature, reports, and statistical data, the study seeks to provide a comprehensive understanding of how climate-related environmental changes influence human mobility and social vulnerability. The descriptive approach allows the research to critically analyze trends, identify patterns, and highlight key areas of concern in the Nepalese context without the need for new data collection.

### Secondary Sources

All secondary sources were selected based on relevance, credibility, and depth of information. Academic journal articles, books, government reports, and publications by international organizations such as UNDP, IOM, FAO, and reputable NGOs were prioritized. Only materials that directly addressed climate change impacts, migration, or social vulnerability in Nepal were included. Sources were further evaluated for their methodological soundness, recency, and comprehensiveness, ensuring that the study relies on robust, evidence-based information. By using only secondary data, the research builds on verified and accessible knowledge while avoiding duplication of existing studies.

### Time Period Covered

The research focuses on data and literature from 1990 to 2025, a period that reflects significant environmental, social, and economic changes in Nepal. This timeframe captures the emergence of climate change as a major global and national concern and coincides with the increasing academic and policy attention to migration and social vulnerability in Nepal. Using this period allows the study to identify both historical trends and contemporary developments, providing a long-term perspective on how climate variability has affected communities and migration patterns across different regions of the country.

### Analytical Framework

The study uses a thematic and comparative analytical framework to interpret the secondary data. First, key themes are identified, including climate-related hazards (floods, droughts, glacial retreat), patterns of migration (internal and international), and indicators of social vulnerability (gender, caste, age, livelihood type, and geographic location). These themes are then compared across different regions of Nepal like mountains, hills, and Terai, to understand regional variations in vulnerability and adaptive capacity. The framework also examines the intersection of social, economic, and environmental factors, highlighting which communities are most at risk and how migration serves as both an adaptive strategy and a source of new vulnerabilities.

By relying entirely on secondary data, this methodology ensures that the study is grounded in existing, credible knowledge while enabling a detailed exploration of climate change, migration, and social vulnerability in Nepal. The conceptual and descriptive approach, combined with careful source selection, temporal focus, and a structured analytical framework, allows the research to offer meaningful insights for policymakers, development practitioners, and scholars seeking to understand and address these intertwined challenges.

## LITERATURE REVIEW

Climate change has become a tangible reality in Nepal, profoundly affecting the environment, livelihoods, and social structures. The country's diverse topography, from the high Himalayas to the lowland Terai, makes it particularly vulnerable to climate-induced hazards such as glacial melting, erratic rainfall, floods, landslides, and prolonged droughts. Every individual may have perceived differently on environmental and natural factors (Pasa, 2023, p. 72). These environmental changes disrupt traditional agricultural practices and threaten the livelihoods of communities that depend on farming and livestock. Climate change has become a threat to agriculture and livelihoods globally (Sapkota, 2025, p. 188). Importantly, these impacts are unevenly experienced, with marginalized groups such as women, the elderly, indigenous communities, and economically disadvantaged households being disproportionately affected. Understanding the social dimensions of climate change is therefore essential to develop adaptive strategies that are both effective and equitable.

Migration has emerged as one of the most common responses to environmental stressors in Nepal. When floods destroy homes or droughts ruin crops, families often have no choice but to seek alternative livelihoods elsewhere, whether temporarily

or permanently. Migration provides opportunities to diversify income sources and reduce exposure to environmental risks. However, it is not a simple or uniform decision. The ability to migrate depends on social and economic resources, cultural norms, and access to networks. Vulnerable groups, such as women, low-income households, and marginalized ethnic communities, may face significant barriers in relocating, which increases their exposure to risk and limits their adaptive options. Migration, therefore, is not just a reaction to environmental stress; it is deeply shaped by existing inequalities and social structures.

Social vulnerability in Nepal is closely tied to both environmental risks and structural inequalities. In Nepal, agriculture remains the dominant livelihood in rural areas, yet many households supplement their income through activities such as small businesses, wage labor, and seasonal migration (Thapa, 2025, p. 177). Communities' susceptibility to harm depends on factors such as economic resources, access to information, social networks, and political representation. Households with diversified livelihoods or strong community support can better withstand floods, droughts, or landslides, while marginalized households face greater challenges in adapting to environmental shocks. Gender, age, and caste also shape vulnerability, with women, elderly people, and socially disadvantaged groups often lacking access to resources and decision-making power. In South Asian societies, collectivism, religious beliefs, and social hierarchy guide political consciousness (Magar, 2025, p. 141). This illustrates that climate change must be studied in conjunction with social and economic conditions, as vulnerability is produced by a combination of ecological exposure and societal inequalities.

The interplay between climate change, migration, and social vulnerability is complex and multidimensional. While migration can provide safety and economic opportunities, it can also create new vulnerabilities. Families moving to urban areas or other regions may encounter insecure employment, inadequate housing, and social exclusion. In some cases, migration places additional stress on those who remain behind, particularly in rural communities where labor shortages and social fragmentation can undermine local resilience. These dynamics highlight that migration is both a coping strategy and a potential source of risk, influenced by environmental stressors as well as social and economic structures.

Regional differences in Nepal further shape how communities experience climate change and respond through migration. The impact of climate change on agriculture in Nepal poses serious challenges that threaten agricultural productivity, food security, and the livelihoods of millions of farmers (Shrestha, 2024, p. 135). Mountainous areas

are highly susceptible to glacial melting and landslides, which threaten agricultural production and water availability. Hill regions face soil erosion and unpredictable rainfall, while the Terai plains are more prone to flooding and waterlogging. These geographic variations, combined with local social and economic conditions, influence how households perceive risk and decide on migration. Cultural norms around family, gender roles, and community cohesion also play a role in shaping adaptive behaviors. Recognizing these local variations is essential for designing policies and interventions that respond to specific needs rather than adopting a one-size-fits-all approach.

Policy and institutional responses are crucial in shaping resilience and adaptive capacity in Nepal. Community-based adaptation programs, disaster risk reduction initiatives, and policies aimed at sustainable livelihoods have the potential to support vulnerable populations. However, gaps remain in implementation, particularly for marginalized groups who often have limited access to resources and information. Effective strategies must integrate environmental management with social equity, ensuring that interventions do not inadvertently reinforce existing inequalities. Strengthening governance, building local capacities, and promoting inclusive decision-making are key steps to reduce vulnerability and support communities in adapting to climate change.

Despite growing attention, research on the linkages between climate change, migration, and social vulnerability in Nepal remains fragmented. Many studies focus on either environmental impacts, migration patterns, or social inequalities in isolation, without exploring how these factors interact. Global studies provide valuable frameworks, but localized research is necessary to capture Nepal's unique socioecological context. Interdisciplinary approaches that combine environmental science, sociology, and development studies can offer a more complete understanding of how climate shocks influence migration and social outcomes. Such an approach is essential for developing strategies that are context-specific, socially inclusive, and sustainable, helping communities adapt effectively to a rapidly changing environment.

## RESULTS AND DISCUSSION

### Climate Exposure and Hazard Patterns in Nepal

Nepal's diverse physiography, stretching from the high Himalayas to the lowland Terai plains, creates highly varied climate exposure, resulting in distinct environmental hazards across regions. Climate change is one of the most critical and emerging issues facing rural communities across the globe, especially in those areas highly reliant on agriculture, like Nepal (Gautam, 2025, p. 127). Over the past three decades, average

temperatures have risen, especially in mountain regions, accelerating glacier melt, while rainfall patterns have become increasingly erratic across hills and plains. This has amplified risks of landslides, flash floods, drought, and glacial lake outburst floods (GLOFs), affecting livelihoods, infrastructure, and ecosystems.

Mountain areas face slow-onset hazards such as snow and glacial melt, while rapid-onset events like floods dominate the Terai, and hill regions experience both droughts and landslides due to rainfall variability. These environmental stresses directly threaten agriculture, which remains the backbone of rural livelihoods, while also exacerbating resource scarcity, water stress, and food insecurity. Table 1 summarizes key climate indicators and hazard patterns in Nepal's three physiographic zones, revealing that mountain regions experience the highest temperature rise and GLOF risk, hills face significant landslide and drought events, and the Terai is highly exposed to flooding. This uneven exposure illustrates that climate change acts as both an ecological and a social stressor, shaping not only environmental conditions but also the vulnerability and adaptive capacity of communities across Nepal.

**Table 1**

*Climate Change Indicators in Nepal by Physiographic Region (1990–2025)*

| Indicator | Mountain Region | Hill Region | Terai Region |
|---|---|---|---|
| Avg. temperature increase ℃ | 1.8 | 1.5 | 1.2 |
| Annual rainfall change (%) | +5 to -10 | +2 to -8 | +3 to -7 |
| Frequency of extreme events | High | Moderate -high | High |
| Common hazards | GLOF's landslides | Landslides, drought | Floods, waterlogging |

Table 1 on climate change indicators across Nepal's physiographic regions shows clear spatial variation in climate impacts between the Mountain, Hill, and Terai zones, demonstrating that environmental change is not uniform but elevation-dependent and geographically conditioned. The data indicate that average temperature rise is highest in the Mountain region (1.8 °C), followed by the Hill (1.5 °C) and Terai (1.2 °C), suggesting a pattern consistent with altitude-related amplification of warming, which makes highland ecosystems particularly vulnerable. Rainfall change is presented as variable ranges rather than fixed values, +5% to −10% in mountains, +2% to −8% in hills, and +3% to −7% in the Terai, indicating growing climatic unpredictability

rather than a uniform trend of increase or decrease, with the mountain region showing the greatest variability and thus the highest hydrological uncertainty. The frequency of extreme events is reported as high in both Mountain and Terai regions and moderate-to-high in hills, implying nationwide intensification of climatic extremes but with heightened exposure in fragile alpine and lowland floodplain environments. Correspondingly, dominant hazards differ by region: glacial lake outburst floods and landslides in the mountains, landslides and drought in the hills, and floods and waterlogging in the Terai, reflecting the interaction between climatic stress and physiographic characteristics. Overall, the table illustrates that Nepal's climate risk profile is region-specific, with mountains facing cryosphere and slope instability threats, hills confronting compound hazards, and the Terai dealing primarily with hydrological disasters, thereby underscoring the necessity of differentiated adaptation strategies rather than a uniform national approach.

**Migration Responses to Environmental Stressors**

Migration in Nepal has emerged as a complex response to environmental stress, economic pressures, and social factors, with households strategically moving to reduce exposure and diversify livelihoods. Internal migration to urban centers like Kathmandu, Pokhara, and Biratnagar has accelerated as floods, landslides, and droughts disrupt agricultural productivity, forcing families to seek employment or temporary residence elsewhere. Similarly, international migration to Gulf countries, Malaysia, and other Asian nations continues to expand, often as a livelihood strategy that indirectly mitigates climate risks by generating remittances.

The migration process, however, is socially mediated: wealthier households, men, and those with existing social networks are more likely to move successfully, while marginalized groups, women, and low-income households face significant barriers, including lack of capital, cultural restrictions, or mobility constraints. Seasonal migration has also increased, with members leaving rural homes for several months to offset crop failure or income loss. Even though Nepal has dry seasons resulting from global climate change, there are no large desert areas in the country (Adhikari et. al., 2022, p. 21). Table 2 highlights major internal migration flows in Nepal and the primary environmental and socio-economic push factors. These patterns show that while migration can serve as an adaptive strategy, it simultaneously exposes migrants to urban vulnerabilities, precarious employment, and social marginalization, demonstrating that mobility is both a coping mechanism and a source of new risks.

**Table 2**
*Major Internal Migration Flows in Nepal (1990–2025)*

| Origin zone | Primary destination | Estimated migrants (thousands) | Primary push factors |
|---|---|---|---|
| Mountain districts | Kathmandu valley | 250 | Loss of agricultural livelihood, GLOF risk |
| Hill districts | Urban centers (central) | 400 | Landslides, erratic rainfall |
| Terai districts | National cities and towns | 600 | Flooding, riverbank erosion |
| All regions | Abroad (Gulf/Asia) | 1,200 | Economic opportunity and climate stress |

The table on major internal migration flows in Nepal (1990-2025) shows that population movement is strongly shaped by environmental stress and economic opportunity, with distinct origin-destination patterns across ecological zones. It indicates that around 250 thousand people migrated from mountain districts primarily to the Kathmandu Valley due to loss of agricultural livelihoods and risks such as glacial lake outburst floods, while approximately 400 thousand left hill districts for central urban centers because of landslides and erratic rainfall affecting rural stability. The Terai districts recorded the largest internal movement, about 600 thousand migrants relocating to national cities and towns, mainly driven by flooding and riverbank erosion that threaten settlements and farmland. Beyond internal migration, the table highlights a major cross-regional trend in which migrants from all physiographic zones, estimated at about 1.2 million, moved abroad, particularly to Gulf and Asian destinations, reflecting the combined influence of economic aspirations and climate-related pressures. Overall, the data illustrate that migration in Nepal is both an adaptive response to environmental vulnerability and a livelihood strategy shaped by regional ecological risks and uneven development opportunities.

**Social Vulnerability and Adaptive Capacity**

The continuity of class struggle in the 21st century is not limited to the old industrial work-places, it has taken on new forms at all levels of social life and has reinforced multidimensional structures of inequality (Magar, 2025, p. 58). Social vulnerability in Nepal demonstrates how pre-existing inequalities shape the ability of communities to respond to climate hazards. Women-headed households, indigenous and marginalized

caste groups, the elderly, and economically disadvantaged families often live in hazard-prone areas and have limited access to land, credit, social networks, or decision-making power, constraining their adaptive capacity.

Conversely, households with diversified livelihoods, strong community support, or urban connections can better manage risk and recover from shocks. Table 3 summarizes the primary constraints and adaptive capacity of vulnerable groups in Nepal, revealing that marginalized populations face systemic barriers that exacerbate climate impacts. Vulnerability is further amplified by intersectional factors: gender, caste, age, and geography interact to determine who bears the brunt of environmental hazards. Consequently, social vulnerability is both a determinant and a result of migration, shaping decisions about whether to move and how to adapt, and reinforcing cycles of risk and inequality across Nepalese communities.

**Table 3**
*Social Vulnerability Indicators by Group in Nepal*

| Vulnerability group | Primary constraints | Adaptive capacity status |
|---|---|---|
| Women -headed households | Limited land access, decision-making | Low |
| Indigenous/marginalized castes | Discrimination, resources exclusion | Very low |
| Economically poor | Limited capital, livelihood options | Low |
| Youth migrants | Skil mismatch, urban vulnerability | Moderate |
| Elderly/disabled | Mobility constraints | Very low |

*Source: Government of Nepal, UNDP, ICIMOD and World Bank.*

The table on social vulnerability indicators in Nepal highlights how different population groups face distinct structural constraints that shape their ability to cope with environmental, economic, and social stresses. It shows that women-headed households experience low adaptive capacity mainly because of limited land ownership and restricted participation in decision-making, while Indigenous and marginalized caste groups face very low adaptive capacity due to discrimination and exclusion from resources. Economically poor populations also have low adaptive capacity because of restricted capital and limited livelihood options, whereas youth migrants are assessed as having moderate adaptive capacity despite challenges such

as skill mismatch and urban insecurity, suggesting some flexibility through mobility and employment opportunities. In contrast, elderly and disabled individuals are categorized as very low in adaptive capacity due to mobility limitations that restrict access to services and support systems. Overall, the table illustrates that vulnerability in Nepal is socially differentiated, with marginalization, poverty, gender inequality, and physical limitations acting as key factors that reduce resilience and increase exposure to risk.

**Climate Change as a Multidimensional Stressor**

The findings confirm that climate change in Nepal operates as a multidimensional stressor that goes far beyond environmental degradation alone. Rising temperatures, erratic rainfall, and the increased frequency of extreme weather events have altered ecological balances across mountain, hill, and Terai regions, directly affecting agriculture, water availability, and settlement patterns. In many villages of the region, water shortage has been a growing barrier to local livelihoods and poverty alleviation (Wagle et. al., 2022, p. 28). These environmental disruptions translate into livelihood insecurity, food shortages, and declining rural economies, particularly in regions where subsistence agriculture dominates. Climate change thus functions as a structural force that intensifies existing development challenges, reinforcing poverty and inequality rather than acting as an isolated environmental phenomenon.

At the same time, climate change must be understood as a cumulative and long-term process rather than a series of isolated disasters. Recurrent floods, landslides, or droughts gradually erode household assets, savings, and social resilience, reducing the capacity of communities to recover from subsequent shocks. This slow-onset vulnerability is particularly damaging because it often remains invisible in policy responses that prioritize emergency relief over long-term adaptation. As a result, climate stress compounds social vulnerability, making certain populations chronically exposed to risk while limiting their ability to plan for the future. Recognizing climate change as a multidimensional stressor is therefore essential for designing adaptation strategies that address both immediate hazards and long-term structural impacts.

**Migration as Both Adaptation and Vulnerability**

Migration emerges from the findings as a critical yet ambivalent response to climate-induced stress in Nepal. On one hand, migration enables households to diversify income sources, reduce dependence on climate-sensitive livelihoods, and secure remittances that support families left behind. Seasonal and circular migration,

in particular, has become a common strategy for managing climate uncertainty, allowing households to cope with crop failure, land degradation, and declining rural employment opportunities. In this sense, migration functions as an adaptive mechanism embedded within household survival strategies.

On the other hand, migration also generates new forms of vulnerability that often remain overlooked. Migrants, especially those moving to urban informal settlements or abroad, frequently face precarious working conditions, insecure housing, limited access to health services, and social exclusion. Women migrants and low-skilled workers are particularly vulnerable to exploitation and unsafe labor conditions. Moreover, migration can weaken rural communities by creating labor shortages, disrupting social cohesion, and placing additional burdens on women, elderly people, and children who remain behind. These dynamics demonstrate that migration cannot be viewed solely as a solution to climate stress; it is a complex process that redistributes risk rather than eliminating it.

**Unequal Social Vulnerability and Structural Barriers**

The analysis clearly demonstrates that social vulnerability in Nepal is deeply rooted in structural inequalities related to caste, gender, class, age, and geography. Nepal's development trajectory remains deeply uneven, shaped by enduring structural inequalities and the persistent marginalization of peripheral regions and vulnerable social groups (Shrestha, 2025, p. 61). Marginalized groups often occupy hazard-prone land due to historical exclusion, limited land ownership, and restricted access to political power. Women-headed households, indigenous communities, and economically disadvantaged groups face systemic barriers that limit their ability to adopt climate-resilient technologies, access credit, or benefit from state support programs. As a result, these populations experience climate change not only as an environmental threat but as a force that reinforces long-standing social injustice.

Furthermore, vulnerability is intersectional, meaning that multiple forms of disadvantage interact to shape exposure and adaptive capacity. For example, an elderly woman from a marginalized caste living in a flood-prone rural area faces layered vulnerabilities that cannot be addressed through single-sector interventions. These findings suggest that adaptation policies focused solely on infrastructure or technology will be insufficient unless they also address social exclusion, power relations, and unequal access to resources. Reducing vulnerability therefore requires transformative approaches that challenge structural barriers and promote inclusive development alongside climate adaptation.

## Linking Climate Change, Migration, and Social Vulnerability

The study reinforces the idea that climate change, migration, and social vulnerability are not separate processes but interconnected elements of a single socio-environmental system. Climate stress acts as a trigger that interacts with social inequalities, influencing who migrates, who stays, and who benefits or suffers from mobility. Migration, in turn, reshapes social vulnerability by redistributing labor, income, and risk across regions and households. Understanding these linkages is crucial for avoiding fragmented policy responses that address one issue while ignoring others.

This interconnected perspective also challenges simplistic narratives that frame climate migrants either as victims or as rational economic actors. In reality, migration decisions are shaped by a combination of environmental pressures, social constraints, cultural norms, and institutional contexts. Recognizing this complexity allows for more nuanced and humane responses that support adaptive capacity while minimizing harm. It also highlights the need for cross-sector collaboration among climate planners, migration experts, and social policymakers.

## Knowledge Gaps and Research Needs

While secondary data provide valuable insights into broad trends, the findings also reveal significant gaps in existing research. Much of the current literature relies on macro-level data, which often fails to capture household-level decision-making processes, lived experiences of migrants, and gendered dimensions of vulnerability. There is limited longitudinal research examining how repeated climate shocks influence migration trajectories, social mobility, and long-term wellbeing. Addressing these gaps is essential for developing evidence-based and context-sensitive policies.

Future research should adopt interdisciplinary and mixed-method approaches that combine quantitative analysis with qualitative narratives and participatory methods. Community-based studies, life-history interviews, and ethnographic research can deepen understanding of how people perceive climate risk, make migration decisions, and negotiate vulnerability over time. Such approaches would not only enrich academic knowledge but also ensure that policy interventions are grounded in the realities of affected communities rather than abstract models.

## Policy Implications and Integrated Planning

The results highlight the urgent need for integrated policy frameworks that link climate adaptation, migration governance, and social protection. Region-specific adaptation strategies are essential, given Nepal's diverse ecological zones and hazard

profiles. Mountain regions require glacier risk management and water security planning, hill areas need soil conservation and landslide prevention measures, and the Terai demands flood management and resilient infrastructure. Without such contextualized planning, national adaptation policies risk being ineffective or uneven in their outcomes.

Equally important is the integration of migration into climate and development planning. Migration should be recognized as a legitimate adaptive strategy rather than treated solely as a development failure or security concern. Policies must ensure safe migration pathways, labor protections, access to social services, and support for households left behind. Social protection programs, such as insurance schemes, cash transfers, and livelihood diversification initiatives, should prioritize vulnerable groups identified in this study. Integrated planning that connects climate resilience with social justice can significantly enhance Nepal's capacity to manage climate-induced risks in a sustainable and equitable manner.

## CONCLUSION

This study shows that climate change in Nepal is not just about rising temperatures or extreme weather events; it is about how these changes reshape everyday life, livelihoods, and social relationships. Floods, landslides, droughts, and glacial melting are increasingly disrupting agriculture and rural economies, pushing many households to make difficult decisions about survival. Migration has become one such response—sometimes offering hope through new opportunities and income, but often exposing people to new risks and insecurities. These experiences are not the same for everyone. Social position, gender, caste, economic status, and location strongly influence who can adapt, who must migrate, and who remains trapped in conditions of vulnerability. In this way, climate change acts as a force that deepens existing inequalities rather than affecting all people equally.

The findings also suggest that meaningful responses to climate change in Nepal must place people, not just policies or infrastructure, at the center of adaptation efforts. Supporting safe and dignified migration, strengthening social protection systems, and addressing long-standing structural inequalities are just as important as managing environmental hazards. Climate adaptation cannot succeed if it ignores social justice, inclusion, and local realities. By recognizing the close links between climate change, migration, and social vulnerability, Nepal can move toward strategies that build resilience while protecting dignity and livelihoods. Such an approach offers a path not only to survive climate change, but to shape a more equitable and sustainable future for all.

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