

# Climate Change, Livelihood Disruptions, and Rural–Urban Migration in India: A Sustainable Livelihood and Climate Justice Perspective

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## Abstract

Climate change is intensifying environmental stressors—rising temperatures, erratic precipitation, sea-level rise, and more frequent extreme events—with profound consequences for livelihoods and human mobility. In India, where large rural populations depend on climate-sensitive sectors such as agriculture, fisheries, and forestry, recurring droughts, floods, cyclones, heatwaves, and irregular monsoons increasingly erode livelihood security and contribute to displacement and rural-to-urban migration, notably in the Sundarbans, coastal Odisha, flood-prone Bihar, and Uttarakhand. This study aims to elucidate the link between climate change and rural–urban migration in India by examining livelihood disruptions, associated socio-economic vulnerabilities, challenges encountered by migrants in urban destinations, and policy options to strengthen resilience and protect vulnerable groups. Using a qualitative, descriptive design based primarily on secondary sources (including government and international agency reports, census and policy documents, and peer-reviewed literature), the study synthesizes evidence through thematic analysis guided by the Sustainable Livelihood Framework, complemented by Political Ecology, Environmental Migration Theory, and Climate Justice Theory. Findings indicate that climate hazards undermine natural, physical, financial, human, and social capital, reducing agricultural productivity, damaging infrastructure, degrading ecosystems, and deepening debt, food insecurity, and poverty; migration thus emerges as a seasonal, circular, temporary, or permanent coping and adaptation strategy, shaped by ecological pressures interacting with inequality, limited livelihood diversification, and governance constraints. Vulnerability is uneven, disproportionately affecting small and marginal farmers, landless workers, women, indigenous communities, and lower caste groups; gendered impacts include feminization of agriculture and heightened risks for women migrants in informal urban labor markets. Urban destinations often reproduce or intensify vulnerability through insecure employment, inadequate housing, barriers to welfare and services, exposure to heat and flooding, and social marginalization, as starkly revealed during the COVID-19 lockdowns. The study concludes that climate-induced migration should be recognized as both adaptation and a symptom of structural vulnerability, requiring integrated policies that build climate-resilient rural livelihoods, mainstream migration in adaptation planning, ensure portability of social protection, strengthen labor and housing, develop climate-resilient cities, and advance climate justice through inclusive governance and targeted support for vulnerable populations.

**Keywords:** Climate change, Environmental stressors, Rural-urban migration, Livelihood disruptions, Socio-economic vulnerabilities, Sustainable Livelihood Framework, Climate Justice Theory, Climate-resilient livelihoods, Climate-resilient cities, Climate-induced migration, Adaptation, Structural vulnerability

## 1. Introduction

Climate change is one of the most pressing global challenges of the contemporary era. The phenomena of increasing temperatures, altered precipitation patterns, sea level rise, and heightened frequency and intensity of extreme weather events have profound implications for human societies and ecosystems. Among the various consequences of climate change, migration has emerged as a critical adaptation and survival strategy for populations experiencing environmental stressors. Climate-induced migration refers to the movement of individuals or communities whose livelihoods, living conditions, or safety are adversely affected by climate change and environmental degradation. India is particularly vulnerable to the effects of climate change because of its geographical diversity, large population, and significant reliance on climate-sensitive economic sectors. Agriculture remains a crucial source of support for a substantial portion of the rural population, while fisheries, forestry, and related activities continue to be essential sources of livelihood. However, recurring droughts, floods, cyclones, heatwaves, and irregular rainfall patterns have increasingly compromised rural livelihoods, resulting in increased displacement and migration. The impacts of climate change are especially pronounced in regions such as the Sundarbans of West Bengal, coastal Odisha, flood-prone districts of Bihar, and the Himalayan region of Uttarakhand. In these areas, environmental degradation has led to reduced agricultural productivity, damaged infrastructure, intensified livelihood insecurity, and increased poverty. Consequently, many households have adopted migration as a coping mechanism to diversify their income sources and mitigate their vulnerability.

Migration driven by climate change is not solely an environmental concern; it is deeply intertwined with socio-economic inequalities, governance systems and development paths. Vulnerable groups, such as small-scale and marginal farmers, landless workers, women, and indigenous people, often lack the necessary resources to cope with environmental pressures. Consequently, these communities are more severely affected by climate-related disturbances and are more likely to migrate to other areas. While migration can enhance economic opportunities and reduce environmental risks in the areas migrants leave, they frequently encounter new difficulties in their new locations. Challenges such as rapid urban growth, inadequate infrastructure, informal job markets, poor housing conditions, and urban climate threats often heighten the vulnerability of migrant communities. Therefore, understanding the relationship between climate change and migration is essential for developing effective adaptive measures and inclusive public policies.

This study sets out to fulfill several objectives: to explore the link between climate change and rural-to-urban migration in India; to assess how climate-driven environmental changes affect rural livelihoods; to comprehend the socio-economic vulnerabilities linked to climate-induced migration; to analyze the difficulties migrants encounter in urban areas; and to propose policy recommendations for boosting climate resilience and safeguarding vulnerable migrant groups. This study adopts a qualitative and

descriptive approach to examine the connection between climate change and rural-to-urban migration in India. A qualitative method is considered suitable because of the intricate and multifaceted nature of climate migration, which involves environmental, economic, social, and political dimensions that cannot be fully captured by quantitative measures alone. This study mainly depends on secondary data sources. Information was collected from government reports, international organizations, peer-reviewed journal articles, census data, policy documents, books, and research reports on climate change, migration, agriculture, and sustainable development. Key sources include publications from the Intergovernmental Panel on Climate Change (IPCC), World Bank, International Organization for Migration (IOM), United Nations Development Programme (UNDP), Government of India, NITI Aayog, and Census of India. Furthermore, case studies from climate-sensitive areas, such as the Sundarbans, Odisha, Bihar, and Uttarakhand, were reviewed to provide a contextual understanding of migration trends and livelihood vulnerabilities. The gathered data were examined using thematic analysis, concentrating on recurring themes related to environmental stress, livelihood disruption, migration choices, and adaptation strategies. This exploratory study aims to develop a comprehensive understanding of the interactions between climate change and migration, rather than establishing causal links through statistical methods. The Sustainable Livelihood Framework (SLF), created by the Department for International Development (DFID), is the main analytical framework used in this study. This framework views livelihoods as the capabilities, assets, and activities necessary for a means of living and identifies five types of livelihood capital: natural, human, financial, physical, and social. Climate change poses a direct threat to these livelihoods. Droughts, floods, cyclones, and rising temperatures decrease agricultural productivity, damage infrastructure, degrade natural resources, and weaken household income. As livelihood assets decline, households increasingly turn to migration as a strategy for diversifying income and reducing vulnerability. Within this framework, migration is seen as an adaptive response to environmental stress rather than a demographic process.

This study adopts the Sustainable Livelihood Framework as its primary analytical framework to understand how climate-induced disruptions affect livelihood assets and trigger migration. The framework is complemented by Political Ecology, which highlights the role of social and economic inequalities in shaping vulnerability, Environmental Migration Theory, which explains migration as a response to environmental stress, and Climate Justice Theory, which emphasizes the disproportionate burden borne by marginalized communities despite their minimal contribution to climate change.

## **Political Ecology**

Political Ecology provides an essential framework for understanding the varying degrees of vulnerability to climate change. It asserts that environmental issues are fundamentally connected to broader social, economic and political structures. Vulnerability is determined not only by exposure to environmental hazards but also by disparities in access to resources, power, and opportunities. In India, marginalized communities often face increased climate risks owing to structural inequalities, limited land ownership, insufficient financial resources, and inadequate institutional support. Political Ecology highlights how these inequalities influence migration patterns and intensify the vulnerability of populations affected by climate change.

## **Environmental Migration Theory**

Environmental Migration Theory explains migration as a response to changes in the environment and ecological pressures. Environmental deterioration acts as a driving force by reducing job prospects and increasing livelihood insecurity. Simultaneously, cities attract migrants by offering jobs, infrastructure, healthcare, and education. This theory is especially relevant for understanding the seasonal, circular, temporary, and permanent migration trends in India. This clarifies how climate-related disturbances combine with economic elements to shape migration choices.

## **Climate Justice Theory**

Climate Justice Theory examines the principles of equity, responsibility, and vulnerability in the context of climate change. It posits that populations with minimal contributions to global greenhouse gas emissions frequently suffer the most severe consequences of climate impacts. In India, small farmers, agricultural laborers, fishing communities, and indigenous populations contribute insignificantly to climate change, yet experience disproportionate exposure to climate-related disasters. The theory advocates equitable adaptation policies, social protection measures, and inclusive governance frameworks to protect vulnerable populations from environmental and socio-economic risks.

Over the past two decades, research on climate change and migration has significantly expanded. Scholars now widely acknowledge that environmental stress alone does not trigger migration; rather, it interacts with economic, social, and political factors to shape migration decisions. This section examines the key literature on climate-induced migration from rural to urban areas in India. Initially, studies on environmental migration concentrated on the direct connection between ecological degradation and population displacement. Myers (2002) posited that climate change could result in millions of "environmental refugees" globally due to factors such as rising sea levels, desertification, and extreme weather events. Although this perspective highlights the potential scale of displacement, it has been criticized for portraying migration as a simple and inevitable consequence of environmental change. More recent research has adopted a nuanced view, emphasizing the interaction between environmental stress and socioeconomic vulnerability. Black et al. (2011) proposed a multi-causal framework indicating that migration decisions are influenced by economic opportunities, political contexts, social networks, and demographic factors, in addition to environmental changes. This approach has gained prominence in contemporary migration studies as it refrains from reducing migration to merely an environmental issue.

In the Indian context, numerous studies have highlighted the vulnerability of rural livelihoods to climate change. Agriculture predominantly depends on monsoon rainfall, and climate variability significantly affects the crop yields and household income. Mishra and Azeez (2014) demonstrated that erratic rainfall and declining agricultural productivity in semi-arid regions contribute to seasonal migration among farming families. Similarly, Bhagat and Mohanty (2009) identified a strong correlation between distress migration from rural areas and agrarian insecurity, which is exacerbated by a lack of non-farm employment opportunities. The Sundarbans region has received particular scholarly attention because of its acute exposure to sea-level rise, cyclones, and saline intrusion. Ghosh and Banerjee (2018) revealed that environmental degradation in the Sundarbans has reduced agricultural viability and increased out-

migration to Kolkata and other urban centers. Studies in coastal Odisha and flood-prone Bihar also suggest that recurrent disasters disrupt livelihoods and accelerate migration as a coping mechanism. Gender dimensions of climate migration represent another critical area of scholarship. Rao et al. (2020) argued that climate-induced migration often leads to the feminization of agriculture, as women assume greater agricultural and household responsibilities when male family members migrate. Women migrants may also face heightened risks of exploitation, insecure employment and limited access to social services in urban areas. Urban vulnerability has emerged as an increasing concern in migration studies. Scholars have observed that migrants frequently reside in informal settlements characterized by inadequate infrastructure, overcrowding, and exposure to climate hazards such as flooding and heat stress. Revi et al. (2014) emphasized that Indian megacities are increasingly susceptible to climate-related disasters, with poor migrant communities being among the most affected populations. Despite the valuable insights provided by the existing literature, several gaps persist. First, many studies focus on either rural or urban vulnerability in isolation, with limited attention to the continuum linking source and destination areas. Second, policy-oriented analyses often prioritize disaster response over long-term adaptation and social protection for migrants. Third, there is a lack of integration of livelihood, political economy, and climate justice perspectives in explaining migration outcomes. This study aims to address these gaps by integrating multiple theoretical approaches to analyze climate-induced rural–urban migration in India.

Climate change has profoundly affected rural livelihoods across India. Rising temperatures, shifts in rainfall patterns, prolonged droughts, intense floods, cyclones, and rising sea levels influence agricultural output, water resources, infrastructure, and ecosystem services. As a large segment of India's rural populace depends on climate-sensitive industries, these environmental shifts pose a direct threat to household livelihood security. Agriculture is especially at risk, as more than half of India's farmland relies on rain, making it highly vulnerable to fluctuations. Delays in monsoons, irregular rainfall, and more frequent droughts reduce crop yields and heighten the risk of production. Small and marginal farmers, who make up the majority of agricultural households, often lack irrigation systems, crop insurance, and financial reserves to offset their losses. Climate change also affects livelihoods based on fisheries and forestry sectors. Coastal communities face declining fish populations, damage to boats and equipment from storms, saltwater intrusion, and coastal erosion. Forest-dependent communities experience reduced access to forest resources owing to ecosystem changes and conservation restrictions following environmental degradation. The erosion of livelihood assets has wider socio-economic consequences. Income loss worsens debts, food insecurity, and poverty. Households might sell assets, pull children out of school, cut healthcare spending, or seek wage labor elsewhere. In many cases, migration becomes a last-resort strategy when local adaptation measures are insufficient. Vulnerability is unevenly distributed across social groups. Landless laborers, tenant farmers, women, indigenous communities, and lower caste groups often have fewer resources and limited access to institutional support. However, their ability to adapt is hindered by unequal land ownership, limited credit access, weak political representation, and inadequate social protection systems. Consequently, climate change interacts with existing inequalities, worsening rural vulnerability.

In India, climate change–driven migration takes multiple forms, such as seasonal, circular, temporary, and permanent. The nature of migration varies by region and is shaped by environmental stress types, livelihood patterns, and the presence of alternative opportunities. The Sundarbans in West Bengal is one

of the most climate-sensitive delta areas in the world. Rising sea levels, coastal erosion, saline water intrusion, and frequent cyclones have severely affected the agriculture and fisheries sectors. Increased salinity has lowered crop yields, and erosion has obliterated settlements and farmland. Consequently, numerous families migrate, either seasonally or permanently, to Kolkata and nearby urban areas, seeking employment in construction, domestic work, transportation, and informal labor sectors. In the Sundarbans, migration often acts as a survival mechanism rather than as a voluntary economic decision. Coastal Odisha frequently faces cyclones and storm surges from the Bay of Bengal, which damage crops, homes, infrastructure, and fishing equipment. Farmers and fishers, suffering repeated losses, are increasingly moving to cities such as Bhubaneswar, Surat, and Hyderabad for wage work. In certain districts, migration networks have been formalized, with labor contractors aiding the transition to urban labor markets. In Bihar, districts prone to flooding experience regular river floods and waterlogging, which disrupt agriculture and rural jobs. Seasonal migration to Delhi, Mumbai, and Punjab has been common for a long time, but climate variability has heightened livelihood insecurities and increased dependence on migration. Migrants often find work in construction, manufacturing, and low-wage informal sectors with minimal social protections. In Uttarakhand, located in the Himalayan region, irregular rainfall, decreasing water availability, landslides, and changing agricultural conditions have led to the migration of people from mountain villages. Young people frequently move to cities in the plains seeking education, employment, and stable livelihoods. This migration has caused demographic shifts in rural areas, including an aging population and deserted villages. These regional examples illustrate that climate-induced migration is influenced by environmental pressures and broader economic structures. Migration decisions are seldom driven solely by climate events; they result from the interplay between ecological stress, poverty, limited livelihood diversification, and uneven development.

Climate change-driven migration has notable gender-specific effects. Women often face different impacts of climate change than men because of their involvement in agriculture, household duties, water collection, caregiving, and informal work. When men in the household migrate, women frequently assume greater responsibilities for farming and unpaid care tasks, a situation often termed the feminization of agriculture. In many rural regions, women work longer hours managing crops, livestock, fuel gathering, and household chores while also dealing with decreased water availability and food shortages. Despite their crucial role in maintaining households, women often have restricted access to land ownership, credit, agricultural extension services, and decision-making bodies, which limits their ability to adapt to climate change. Women migrating to urban areas may face additional vulnerabilities. They are overrepresented in informal and low-wage sectors, such as domestic work, garment manufacturing, and casual labor. Poor housing, lack of childcare, unsafe working conditions, and limited access to healthcare increase their risk of exploitation and insecurity. Simultaneously, migration can provide opportunities for women's economic involvement and independence in certain situations. Remittances can boost household income, and women may gain more decision-making power in the absence of male migrants than in their presence. However, these potential advantages are inconsistent and heavily depend on social norms, labor market conditions, and access to institutional support.

Migration to urban areas does not inherently reduce the vulnerability of migrants. Indian cities are increasingly prone to climate-related hazards, including heat waves, flooding, water scarcity, and infrastructure stress. Migrants, particularly those with low incomes, often reside in informal settlements

located on floodplains, coastal margins, or environmentally degraded land due to the unaffordability of housing in formal areas. Urban migrants face several intersecting challenges. 1. Insecure Employment: Most migrants are employed in informal sectors without written contracts, job security, health insurance, or social protection. 2. Poor Housing Conditions: Overcrowded settlements with inadequate sanitation, drainage, and electricity increase exposure to disease and climate hazards. 3. Limited Access to Services: Migrants frequently encounter obstacles in accessing healthcare, education, ration systems, and welfare schemes due to documentation and portability barriers. 4. Exposure to Climate Hazards: Heatwaves in cities such as Delhi and Ahmedabad disproportionately affect outdoor workers and residents of poorly ventilated homes. Coastal flooding in cities such as Mumbai threatens low-lying informal settlements where many migrants reside. 5. Social Marginalization: Migrants may experience discrimination, exclusion from urban governance processes, and limited political representation. The COVID-19 pandemic exposed the fragility of migrant livelihoods in urban India, Lockdown measures left millions without income, shelter, or transportation, compelling many to return to rural areas. This crisis demonstrated how external shocks can rapidly exacerbate the vulnerabilities of migrant populations.

Addressing climate change-induced migration requires implementing policies that simultaneously strengthen rural resilience, protect migrant rights, and improve urban adaptability. The following measures are particularly important: Strengthening Climate-Resilient Rural Livelihoods, which involves promoting agriculture resilient to climate change through the use of drought-tolerant and flood-resistant crop varieties, expanding irrigation, water harvesting, and watershed management programs, and improving access to crop insurance, credit, and extension services for small and marginal farmers. Additionally, supporting livelihood diversification through rural non-farm employment, agro-processing, and skill development is crucial. Furthermore, strengthening women's self-help groups and farmer cooperatives is essential to enhance collective resilience.

Integrating Migration into Climate Adaptation Policy - Acknowledging migration as a valid adaptation strategy rather than merely a challenge to be mitigated. - Integrate migration considerations into both national and state climate adaptation frameworks. - Establish data systems to monitor climate-induced migration patterns and the associated vulnerabilities. Protecting Migrants in Urban Areas - Ensure the transferability of welfare entitlements, including ration cards, healthcare, pensions, and social security across state boundaries. - Enhance affordable housing options and improve living conditions in informal settlements. - Strengthen labor protections for informal workers, focusing on occupational safety and access to grievance mechanisms. - Enhance access to education, healthcare, sanitation, and climate-resilient infrastructure for migrant communities. Building Climate-Resilient Cities - Incorporate climate adaptation measures into urban planning, including flood management, heat action plans, and the development of resilient infrastructure. - Protect and restore urban ecosystems, such as wetlands and drainage systems, to mitigate flood risk. - Involve migrant communities in urban governance and disaster preparedness initiatives. Advancing Climate Justice - Prioritize vulnerable populations in adaptation funding and social protection programs. Facilitating participatory decision-making processes involving affected communities, with particular emphasis on women, indigenous groups, and informal workers. - Address structural inequalities related to land, labor, and resource access that exacerbate climate vulnerability.

Climate change is increasingly affecting rural–urban migration patterns in India by undermining livelihood security in climate-sensitive sectors, such as agriculture, fisheries, and forestry. Environmental stresses, including droughts, floods, cyclones, erratic rainfall, and sea-level rise, exacerbate socioeconomic vulnerabilities, prompting many households to migrate as a coping and adaptation strategy. This study demonstrates that climate-induced migration is not solely an environmental issue; it is intricately connected to poverty, inequality, gender relations, governance, and development trajectories. Marginalized groups—particularly small farmers, landless laborers, women, and indigenous communities—bear a disproportionate burden of climate impacts and often have limited adaptive capacity. Migration can provide households with opportunities to diversify their income and reduce their exposure to environmental risks. However, migrants frequently encounter new forms of vulnerability in urban areas, including insecure employment, inadequate housing, limited access to services, and increased exposure to urban climate hazards (UCHs). Therefore, migration should be regarded as both an adaptation strategy and a manifestation of structural vulnerability to climate change. A comprehensive policy response must extend beyond narrow approaches to disaster management. Strengthening climate-resilient rural livelihoods, ensuring social protection and the portability of welfare benefits, improving urban infrastructure, and integrating climate justice principles into governance are essential steps toward building resilience in the region. As climate risks intensify in the coming decades, India's development trajectory will depend on its ability to protect vulnerable populations while promoting inclusive and sustainable adaptations.

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