



Women and Climate Vulnerability in Nadia District

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Abstract: Climate change has emerged as a major challenge affecting rural communities across South Asia. In flood-prone regions of eastern India, environmental hazards such as floods, riverbank erosion, and irregular rainfall patterns have increasingly disrupted traditional livelihoods. These environmental transformations interact with existing social inequalities, producing differentiated impacts across gender and class. This article examines the relationship between climate vulnerability and women's livelihoods in Nadia district of West Bengal. Located in the lower Gangetic plains and intersected by several rivers such as the Bhagirathi, Jalangi, and Churni, the district frequently experiences floods and riverbank erosion that threaten agricultural production and rural settlements. These environmental disruptions often disproportionately affect women because of their dependence on natural resources, their roles in household management, and their limited access to economic assets and decision-making institutions. This article will explore how environmental change has influenced women's livelihood strategies, labour participation, and social mobility in Nadia district. The study argues that while climate vulnerability intensifies gender inequalities, women have also developed adaptive strategies including livelihood diversification, community organization, and traditional ecological knowledge. Understanding the gendered dimensions of climate vulnerability is therefore essential for designing sustainable environmental policies and inclusive rural development strategies.

Keywords: Climate vulnerability, Women's livelihoods, Environmental change, Nadia district

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INTRODUCTION

Climate change and environmental degradation have become critical challenges affecting rural communities around the world. Extreme weather events such as floods, droughts, and storms increasingly disrupt agricultural production and rural livelihoods. These environmental transformations are particularly significant in South Asia, where large populations depend on agriculture and natural resources for survival.

However, the impacts of climate change are not evenly distributed across society. Researchers have demonstrated that environmental hazards frequently intensify existing social inequalities, especially those related to gender and economic status. Women in rural areas often face greater vulnerability because of their limited access to land, credit, and institutional decision-making processes¹

Climate change also affects gender relations by altering labour patterns and economic opportunities. Studies indicate that natural disasters such as floods often reduce female agricultural employment more severely than male employment, increasing women's economic insecurity²

Nadia district in West Bengal provides an important regional context for examining these dynamics. Located within the alluvial plains of the Ganges-Bhagirathi river system, the district has historically depended on agriculture as the primary source of livelihood. According to the *Bengal District Gazetteer*:

Nadia, the region's fertile soil and extensive river network have long supported agricultural production but have also exposed the district to frequent flooding and riverbank erosion³

Environmental vulnerability has intensified in recent decades due to climate variability and changing river dynamics. Studies on flood vulnerability indicate that rural women are often disproportionately affected because they depend heavily on agriculture and natural resources while having limited access to adaptation resources⁴

Furthermore, global research suggests that climate-related disasters widen economic disparities between men and women, particularly in rural households where women already face structural disadvantages⁵.

ENVIRONMENTAL CONTEXT OF NADIA DISTRICT

Nadia district lies within the lower Gangetic plains and is traversed by several important rivers including the Bhagirathi, Jalangi, and Churni. These rivers historically contributed to the agricultural prosperity of the region by depositing fertile alluvial soil. Colonial administrative accounts recorded that agriculture formed the backbone of the district's economy, with rice, jute, and sugarcane as the principal crops⁶.

However, the same river system that sustained agriculture also created environmental vulnerabilities. Seasonal monsoon floods regularly damaged crops and infrastructure. According to district records, riverbank erosion frequently caused the loss of agricultural land and displacement of rural populations.

Post-Independence census reports also reveal the continued dependence of *Nadia*'s population on agriculture and rural labour. A large proportion of the workforce is engaged in agriculture or agricultural labour, indicating the district's continued vulnerability to environmental disruptions. Because rural women often participate in agricultural activities such as planting, harvesting, and food processing, environmental hazards directly affect their economic roles and household responsibilities.

GENDERED DIMENSIONS OF CLIMATE VULNERABILITY

Climate change and environmental degradation are increasingly recognized as socially differentiated phenomena that affect various groups within society in unequal ways. Gender scholars have emphasized that environmental risks such as floods, droughts, and river erosion do not impact men and women equally because of existing inequalities in access to resources, labour divisions, and decision-making power. Women frequently experience greater vulnerability to climate change because they often have limited control over productive assets, lower access to financial resources, and restricted participation in political and institutional decision-making processes⁷. These structural inequalities shape how environmental crises affect women's livelihoods, health, and social mobility.

One influential framework for understanding the gendered impact of environmental change is Amartya Sen's capability approach, which emphasizes that development should be evaluated not simply in terms of economic growth but in terms of the expansion of human capabilities and freedoms⁸. According to this perspective, individuals require access to resources, opportunities, and social institutions in order to achieve meaningful well-being. Environmental disasters such as floods and storms can significantly restrict

these capabilities by damaging livelihood resources, reducing access to education and healthcare, and increasing economic insecurity. For rural women who already face structural disadvantages in terms of land ownership, employment opportunities, and social mobility, such environmental disruptions can further intensify existing inequalities.

Research across South Asia indicates that women's vulnerability to climate change is shaped by multiple intersecting factors including poverty, social norms, limited access to education, and unequal control over productive resources⁹. In many rural communities, traditional gender roles assign women primary responsibility for household management, including food preparation, water collection, and care giving. While these responsibilities are essential for household survival, they also increase women's exposure to environmental stress. For instance, during periods of drought or flooding, women must often travel longer distances to obtain drinking water or fuel wood, thereby increasing their physical workload and reducing the time available for education, income-generating activities, or community participation.

Environmental hazards also have a profound impact on women's employment opportunities. In many parts of rural India, women participate actively in agricultural production as wage laborers or family workers. However, they often lack formal ownership of land and agricultural resources, which limits their economic independence and bargaining power within households¹⁰. Climate-related disasters such as floods and crop failures can therefore disproportionately affect women's employment prospects. When agricultural production declines due to environmental disruptions, women's labour is frequently the first to be displaced because it is considered supplementary rather than primary within the household economy. This dynamic contributes to increasing economic vulnerability among rural women.

In flood-prone regions such as Nadia district in West Bengal, environmental hazards place additional burdens on women's daily lives. Nadia lies within the alluvial plains of the Ganges river system and is intersected by several rivers including the Bhagirathi, Jalangi, and Churni. Seasonal floods and riverbank erosion have historically affected agricultural production and rural settlements in the region¹¹. These environmental challenges often require households to adopt coping strategies that rely heavily on women's labour. During floods, women frequently assume responsibility for safeguarding household food supplies, caring for children and elderly family members, and managing temporary shelters.

Furthermore, environmental disasters can significantly affect women's access to basic services such as healthcare, sanitation, and education. Floods often damage transportation networks, schools, and medical facilities, making it difficult for rural populations to obtain essential services. For women, these disruptions can be particularly severe because they often depend on local infrastructure for maternal healthcare, childcare, and community support networks. Reduced access to healthcare during environmental crises can also increase health risks related to pregnancy, malnutrition, and water-borne diseases.

Another important dimension of gendered climate vulnerability involves the unequal distribution of decision-making power within households and communities. In many rural areas, men are more likely to participate in village councils, agricultural cooperatives, and local governance institutions. As a result, women's voices are often underrepresented in decisions regarding resource management, disaster preparedness, and environmental policy¹². This exclusion can limit women's ability to influence

adaptation strategies or advocate for policies that address their specific needs.

WOMEN'S ADAPTIVE STRATEGIES

Despite these challenges, women frequently develop adaptive strategies to cope with environmental change. These strategies include diversification of livelihoods, participation in self-help groups, and the use of traditional ecological knowledge.

Research suggests that women play an important role in environmental management because of their everyday interaction with natural resources¹³. Their knowledge of local ecosystems and agricultural practices can contribute to climate resilience.

Community-based organizations such as self-help groups also provide financial and social support that helps women develop alternative livelihood strategies. Such initiatives can enhance women's economic independence and improve their capacity to respond to environmental crises.

CONCLUSION

Climate vulnerability presents significant challenges for rural communities in Nadia district. Floods, riverbank erosion, and changing rainfall patterns threaten agricultural production and economic stability. Women are particularly affected by these environmental transformations because of their dependence on natural resources and their limited access to economic assets.

However, women are not merely passive victims of environmental change. Through livelihood diversification, community organization, and ecological knowledge, they actively participate in adapting to climate challenges. Recognizing women's contributions and addressing structural inequalities are therefore essential for creating sustainable and gender-inclusive climate policies.

Future research should combine archival sources, census data, and oral histories to examine the lived experiences of women in climate-vulnerable communities of Nadia district.

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