



Social Impacts of Riverbank Erosion at Hatpachil Village, Shahjadpur Upazila of Sirajganj District

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Abstract

Riverbank erosion is one of the most persistent environmental hazards in Bangladesh and it produces widespread displacement, loss of property, and disruption to community life. This study examines the social impacts of erosion in Hatpachil village, located in Shahjadpur Upazila of Sirajganj District, an area frequently affected by the shifting course of the Jamuna River. A qualitative research design was adopted to capture the lived experiences of affected households and the perspectives of local stakeholders. Data were collected through 20 in-depth interviews with displaced residents and 10 key informant interviews with teachers, community leaders, and NGO representatives. The survey data were analyzed using descriptive statistical techniques such as frequency and percentage analysis, with results visualized through pie charts and bar diagrams prepared in Microsoft Excel, and subsequently interpreted within the Sustainable Livelihood Framework (SLF). The analysis focused on two central themes: displacement and property loss, and education and livelihood change. Findings reveal that erosion has forced many families to abandon homesteads and cultivable land, leading to repeated cycles of displacement and economic insecurity. Property loss has eroded intergenerational assets and created dependency on precarious forms of wage labor. Educational continuity has also been disrupted, as displacement often results in school dropout and reduced access to learning opportunities. At the same time, livelihood patterns have shifted from agriculture to unstable informal occupations, exposing households to new vulnerabilities. The study underscores the need for stronger institutional support and long-term strategies to address both the material and social consequences of riverbank erosion. By documenting the case of Hatpachil village, the research highlights the complex interplay between environmental hazards and social transformation in rural Bangladesh.

Keywords: *Riverbank erosion, displacement, property loss, education, livelihood change.*

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Introduction

Riverbank erosion is among the most pressing environmental challenges in Bangladesh, profoundly shaping the lives and livelihoods of millions of people living along its major rivers. As a deltaic country traversed by the Ganges, Brahmaputra, and Meghna river systems, Bangladesh experiences dynamic river morphology that leads to frequent land loss and displacement (Islam & Rashid, 2011). Unlike sudden disasters such as cyclones or floods, riverbank erosion is a slow-onset hazard that quietly reshapes entire communities by taking away cultivable land, homesteads, and sources of livelihood. According to the Center for Environmental and Geographic Information Services (CEGIS), thousands of hectares of land vanish annually due to river erosion that makes countless families homeless and economically vulnerable (Malak et al., 2021).

The district of Sirajganj, particularly Shahjadpur Upazila, is highly prone to riverbank erosion as it lies along the Jamuna River, one of the most unstable rivers in the country. Hatpachil village, the focus of this study, has faced recurrent erosion events that have forced residents to adapt to a cycle of displacement and resettlement. In this context, erosion not only erases land but also undermines social stability, weakens community bonds, and disrupts generational inheritance of property and resources (Haque, 1991). For many rural households, the riverbank is not merely a geographic boundary, it represents home, security, and identity. Its erosion thus directly translates into the erosion of both material assets and intangible social well-being.

The most visible outcome of riverbank erosion is the displacement of families from their homestead lands. Displacement in Bangladesh is often involuntary and immediate, with households having little or no time to prepare for relocation. Studies indicate that erosion-induced displacement contributes significantly to internal migration, swelling urban slums with rural migrants who arrive with few resources or support networks (Rahman, 2010). Displaced families often lose not only their land but also their sense of community, social capital, and traditional support systems (Paul & Routray, 2010). In Hatpachil, the recurring threat of erosion has forced some households to shift multiple times within their lifetime, leading to a chronic state of uncertainty and insecurity.

Property loss further compounds the displacement experience. Agricultural land, the mainstay of rural livelihoods, is frequently the first casualty of erosion. For many families, this means the abrupt loss of their primary source of income and food production. As Zaman (1989) highlights, erosion is not merely an environmental phenomenon but a deeply social process, as it destabilizes class structures, economic relationships, and social hierarchies. Thus, the theme of “Displacement and Property Loss” is central to understanding the depth of social impacts in erosion-affected regions.

Beyond the immediate physical loss, riverbank erosion generates long-term consequences for education and livelihoods. Children’s education is often disrupted when schools are damaged, relocated, or become physically inaccessible after erosion events. Families facing displacement may also deprioritize schooling as economic survival takes precedence, resulting in early dropout rates and reduced literacy levels (Islam et al., 2020). In Hatpachil, interviews with teachers and community members reveal that education often becomes a casualty of repeated migration, limiting opportunities for upward social mobility among affected households.

Livelihoods also undergo significant transformation. Households that once relied on farming are forced to adapt to wage labor, rickshaw pulling, or other informal sector work, often in urban areas where opportunities are precarious and poorly paid (Rahman, 2010). This transition from land-based livelihoods to unstable urban employment creates a new set of vulnerabilities, including income insecurity, poor housing conditions, and limited access to healthcare and education. The theme of “Education and Livelihood Change” therefore highlights the compounding nature of erosion impacts, where the initial loss of property triggers negative effects across other dimensions of life.

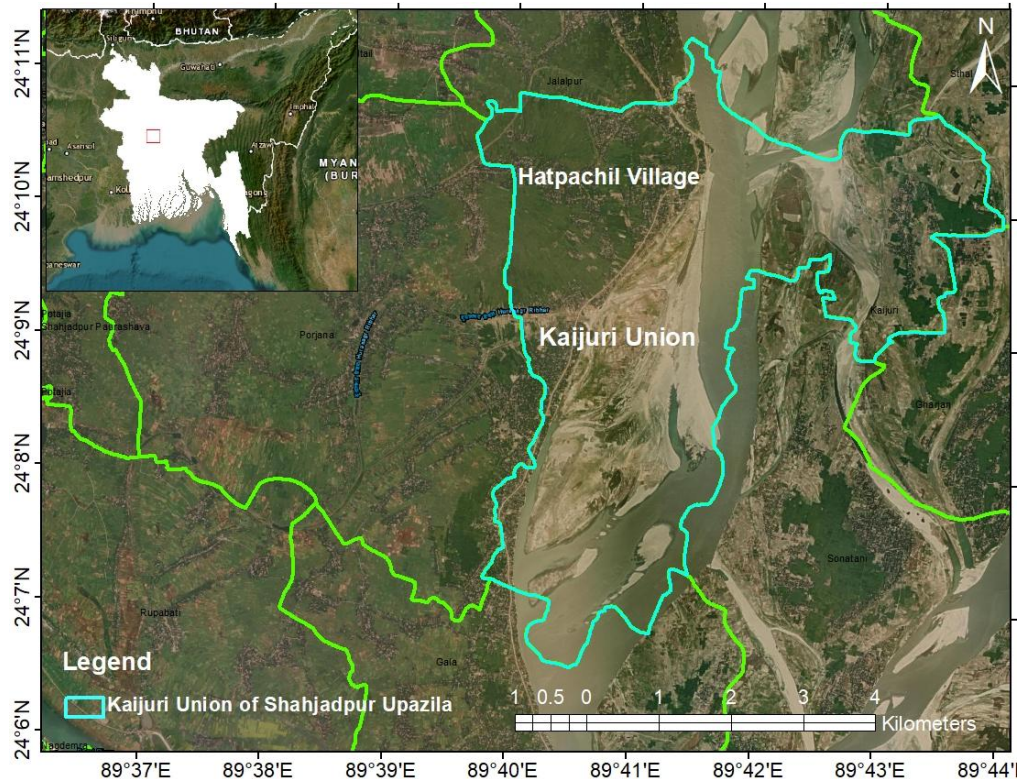
Although riverbank erosion has been widely studied in Bangladesh, localized case studies remain essential to understand its nuanced social impacts. Each erosion-prone community responds differently depending on its socio-economic structure, available coping strategies, and institutional support. Hatpachil village represents a microcosm of the broader national challenge, offering insights into how displacement and livelihood changes unfold in a specific context. By focusing on this community, the study aims to contribute to both academic literature and policy discussions, emphasizing the human face of environmental change.

This study employed In-depth Interviews (IDIs) and Key Informant Interviews (KIIs) to capture lived experiences and institutional perspectives. Themes were organized under Displacement and Property Loss and Education and Livelihood Change, allowing for a comprehensive understanding of the multi-dimensional impacts of erosion. Such a methodological approach ensures that findings are not only empirically grounded but also resonate with community realities, thereby enhancing their credibility and policy relevance. The main objectives of this research are to measure the scale of property loss, to assess the displacement status of households, and to identify how erosion has influenced both education and livelihood patterns in Hatpachil village. By focusing on these aspects, the research provides a good understanding of the social impacts of riverbank erosion and offers insights that may inform policy responses aimed at reducing vulnerability and supporting resilience in erosion-affected communities.

Study Area

Hatpachil village (Figure 1) in Shahjadpur Upazila of Sirajganj District was chosen as the study area due to its long history of severe riverbank erosion along the Jamuna River, which continues to reshape the settlement pattern and livelihoods of local residents.

Figure 1 Riverbank erosion affected Hatpachil village located in Kaijuri Union, Shahjadpur Upazila, Sirajganj District



Over the past several years, recurring erosion has washed away homesteads, croplands, and community spaces, forcing families to relocate repeatedly and adapt to unstable living conditions. Sirajganj is widely recognised as one of the most erosion-affected districts in Bangladesh, with annual losses of agricultural land and household structures reported by both national agencies and independent studies (Ali et al., 2021). Hatpachil represents a concentrated example of this hazard, making it an appropriate site for examining the social impacts of displacement, economic insecurity, and disruptions to education that stem from geomorphological changes along the river. The village's high exposure, repeated losses, and the vulnerability of its residents provide a strong rationale for selecting it as a representative erosion-prone community for this research.

Methodology

This study employed a qualitative research design to examine the social impacts of riverbank erosion in Hatpachil village, Shahjadpur Upazila of Sirajganj District. A qualitative approach was chosen because it is particularly effective in capturing lived experiences, emotions, and perceptions that cannot be easily quantified (Creswell & Poth, 2016). The focus was placed on understanding how erosion reshapes community life through the themes of displacement and property loss, and education and livelihood change.

Sampling Strategy

A purposive sampling strategy was used to ensure that participants had direct experience with riverbank erosion and its consequences. Purposive sampling is widely applied in qualitative studies because it enables the selection of information-rich cases that best address the research questions (Patton, 2014). The study included 30 participants: 20 community members who had experienced displacement and property loss, and 10 key informants drawn from school teachers, NGO representatives, and community leaders. This combination allowed for both household-level perspectives and broader institutional insights.

Data Collection Methods

In-depth Interviews (IDIs): Twenty in-depth interviews were conducted with residents who had been displaced by riverbank erosion. A semi-structured interview guide was used, focusing on property loss, livelihood transitions, and the challenges of maintaining education under displacement. Semi-structured IDIs strike a balance between structure and flexibility, ensuring comparability while allowing participants to share their experiences in their own words (Bryman, 2016).

Key Informant Interviews (KIIs): Ten key informant interviews were conducted with individuals knowledgeable about erosion management and community welfare. These included teachers, NGO representatives, and local leaders. The interviews provided insights into institutional responses, challenges in delivering aid, and long-term strategies for managing erosion. Such data complemented the household-level narratives and offered a broader perspective on policy and support structures (Lincoln & Guba, 1985).

Data Analysis

The analyzed data were subsequently organized and interpreted using the Sustainable Livelihood Framework (SLF) to understand how riverbank erosion affects household livelihood capitals and vulnerability patterns. All transcripts were analyzed thematically, following an inductive approach to identify recurring patterns within the two central themes. Thematic analysis is a common method in qualitative research that enables researchers to systematically code and categorize data while remaining close to participants' voices (Braun & Clarke, 2006). This approach ensured that both household experiences and institutional perspectives were meaningfully integrated into the analysis.

Ethical Considerations

Ethical guidelines were strictly followed at every stage of the study. Participants were informed about the purpose of the research, the voluntary nature of their participation, and their right to withdraw at any time. Verbal consent was obtained before conducting interviews. Confidentiality was ensured by anonymizing personal identifiers and restricting data use to academic purposes only. Adherence to ethical protocols is essential in qualitative research, particularly when working with vulnerable populations affected by displacement (Orb et al., 2001).

Results and Discussion

The data was collected through a questionnaire survey using in-depth interviews (IDIs) and key informant interviews (KIIs) in Hatpachil village, Shahzadpur, Sirajganj, focusing on the social impacts of riverbank erosion. The total sample size consisted of 30 respondents (20 IDIs and 10 KIIs). Table 1 presents the demographic characteristics of the respondents, including gender, age group, occupation before and after displacement, and education level.

Table 1. Demographic Characteristics of Respondents

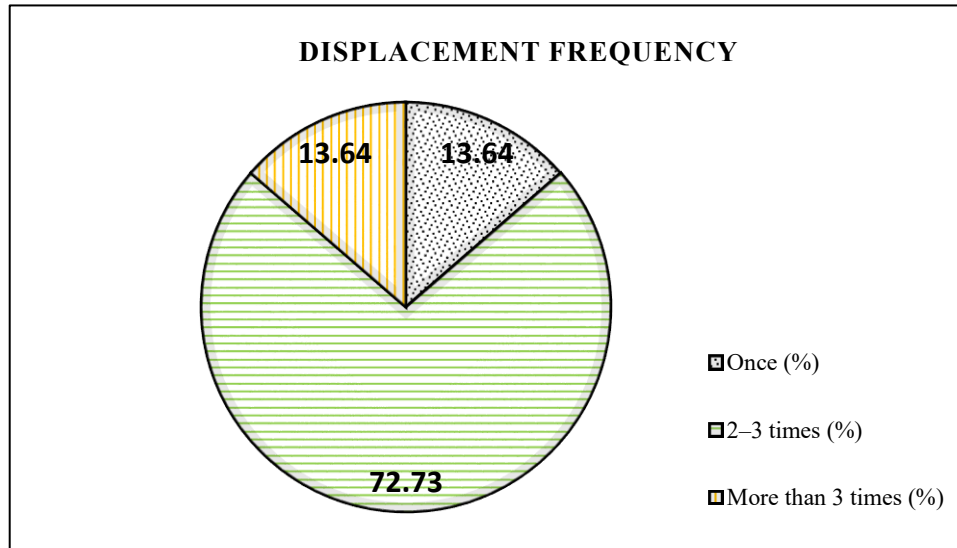
Category	Sub-category	Percentage (%)
Gender	Male	83.33
	Female	16.67
Age Group	18–30 years	16.67
	31–50 years	53.33
	51 and above	30
Occupation Before Displacement (only for displaced people)	Farming	50
	Fishing	13.64
	Day labor	0
	Small business/Job	18.18
Occupation After Displacement	Farming	0
	Fishing	13.64
	Day labor	13.64
	Small business	59.09
	Others	13.64
Education Level	No schooling	26.67
	Primary	40
	Secondary	6.67
	Higher study	26.67

The findings are interpreted using the Sustainable Livelihood Framework (SLF), which conceptualizes livelihoods in terms of five interrelated capitals—human, natural, physical, financial, and social—operating within a vulnerability context shaped by shocks such as natural hazards (Scoones, 1998). Riverbank erosion in Hatpachil village represents a persistent environmental shock that progressively undermines these livelihood capitals and constrains households' capacity to achieve sustainable livelihoods. The discussion is organized into two major themes: Displacement and Property Loss, and Education and Livelihood Change, each analyzed in relation to the SLF's vulnerability context and livelihood capitals.

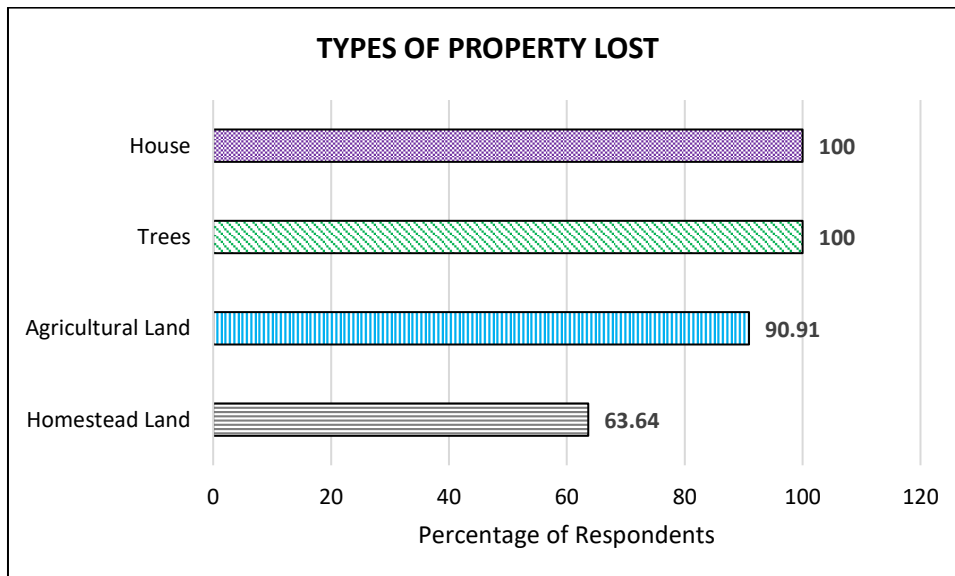
Displacement and Property Loss under the Sustainable Livelihood Framework

Within the SLF vulnerability context, riverbank erosion functions as a recurring shock that continuously destabilizes household livelihoods. Displacement frequency provides a clear indication of this instability.

As shown in Figure 2, 72.73% of respondents reported being displaced two to three times, while 13.64% experienced displacement more than three times due to riverbank erosion. Such repeated displacement reflects chronic exposure to environmental risk rather than a single episodic event. From an SLF perspective, repeated shocks erode households' ability to recover lost assets and increase long-term vulnerability (Scoones, 1998).

Figure 2 Displacement frequency of the respondents due to riverbank erosion

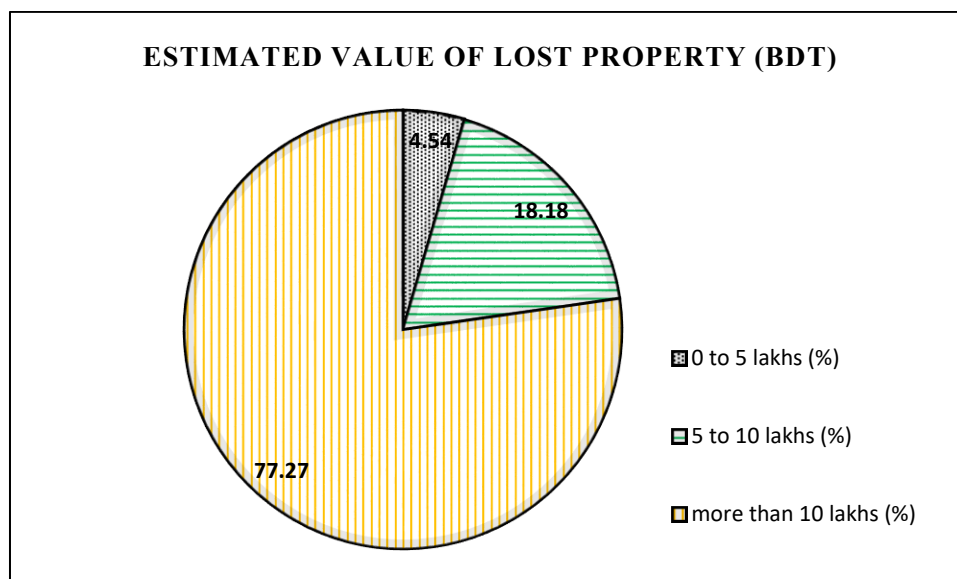
Displacement is closely associated with the loss of key livelihood assets, particularly physical and natural capital, which are essential for rural subsistence. Figure 3 indicates that all displaced respondents lost their houses and trees (100%), while losses of agricultural land and homestead land were reported by 90.91% and 63.64% of respondents, respectively.

Figure 3. Property lost types of the respondents due to riverbank erosion

These findings highlight how erosion directly destroys productive natural capital, such as cultivable land, while simultaneously eliminating physical capital in the form of housing and infrastructure. Previous studies have shown that the loss of land-based assets is one of the most devastating consequences of riverbank erosion in Bangladesh, as it undermines food security, income generation, and social status (Zaman, 1989; Haque, 1991).

The erosion of physical and natural capital is further compounded by severe financial losses. As illustrated in Figure 4, 77.27% of respondents reported property losses exceeding 10 lakhs BDT, while only a small proportion reported losses below this threshold. Within the SLF framework, such extensive losses signify a major depletion of financial capital, limiting households' capacity to invest in recovery, education, or alternative livelihood strategies. Similar patterns have been observed in other erosion-prone areas of Bangladesh, where affected households often fall into long-term poverty due to the absence of adequate compensation or institutional support (Rahman, 2010; Islam & Rashid, 2011).

Figure 4 Estimated value of lost property of the respondents due to riverbank erosion



The social dimensions of these losses are further illustrated through visual evidence and key informant perspectives. The photographs in figure 5 provide a vivid account of the social realities faced by the community in Hatpachil village. In figure 5A, the erosion of riverbanks has directly engulfed homesteads, forcing families to abandon their long-established residences. Figure 5B shows the loss of cultivable land, which threatens household food security and reduces income sources for affected farmers. Meanwhile, figure 5C illustrates the fieldwork process, where school teachers were consulted as key informants to understand how riverbank erosion has disrupted children's education and reshaped broader social structures. Beyond material loss, displacement weakens social capital by fragmenting kinship networks, disrupting community cohesion, and reducing access to informal support systems. Key informants emphasized that repeated relocation often breaks neighborhood ties and undermines collective coping mechanisms, findings that align with earlier research on erosion-induced displacement in rural Bangladesh (Paul & Routray, 2010).

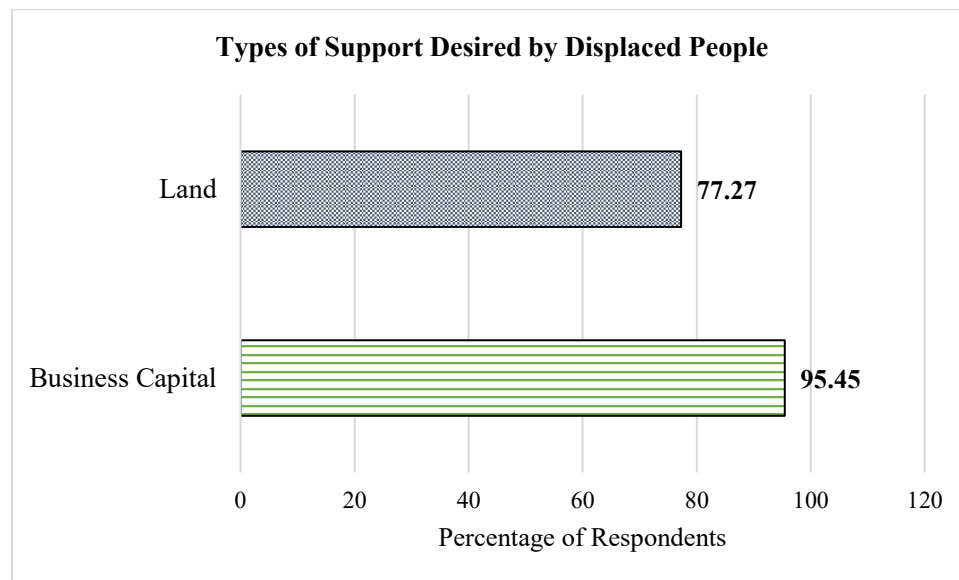
Figure 5 Social impacts of riverbank erosion

Note. 5A: Photograph of land erosion leading to homestead land loss in Hatpachil village. 5B: Photograph of agricultural land loss caused by riverbank erosion. 5C: Key informant interview with school teachers on the social impacts of riverbank erosion.

Households' expressed needs following displacement provide insight into their attempts to rebuild lost livelihood capitals. In many cases, this loss of property is accompanied by a lack of sufficient compensation or support, as the displaced families often struggle to rebuild their homes and livelihoods. These findings resonate with similar studies conducted in other riverbank erosion-prone areas, where the displaced populations experience prolonged economic hardships due to insufficient government aid and a lack of alternative housing solutions (Rahman, 2010).

Figure 6 shows that 77.27% of respondents expressed a need for homestead and agricultural land, while 95.45% sought support for business capital. Within the SLF framework, these demands indicate efforts to restore natural, physical, and financial capital simultaneously. The strong emphasis on business capital suggests a forced transition away from land-based livelihoods toward non-agricultural activities, a trend commonly observed among erosion-affected populations facing land scarcity (Malak et al., 2021).

Figure 6 Types of support desired by people who got displaced due to riverbank erosion

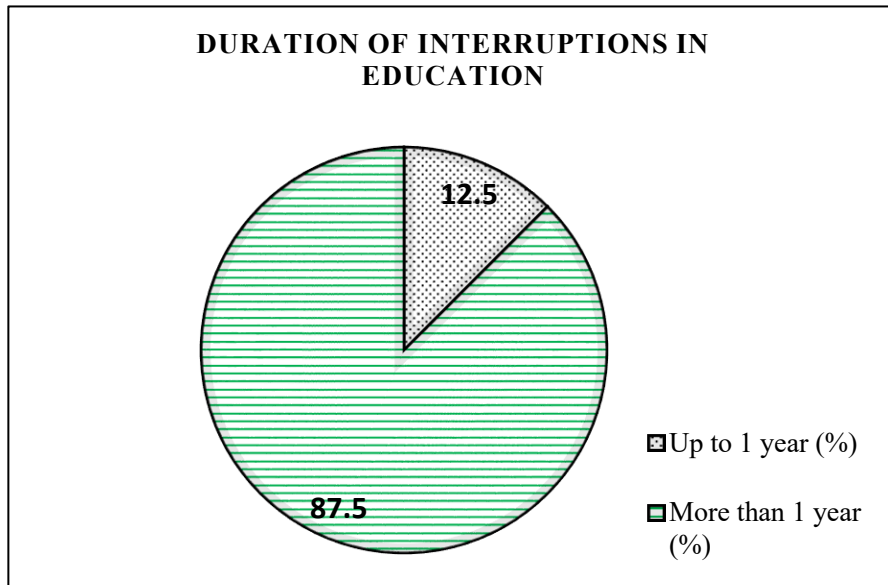
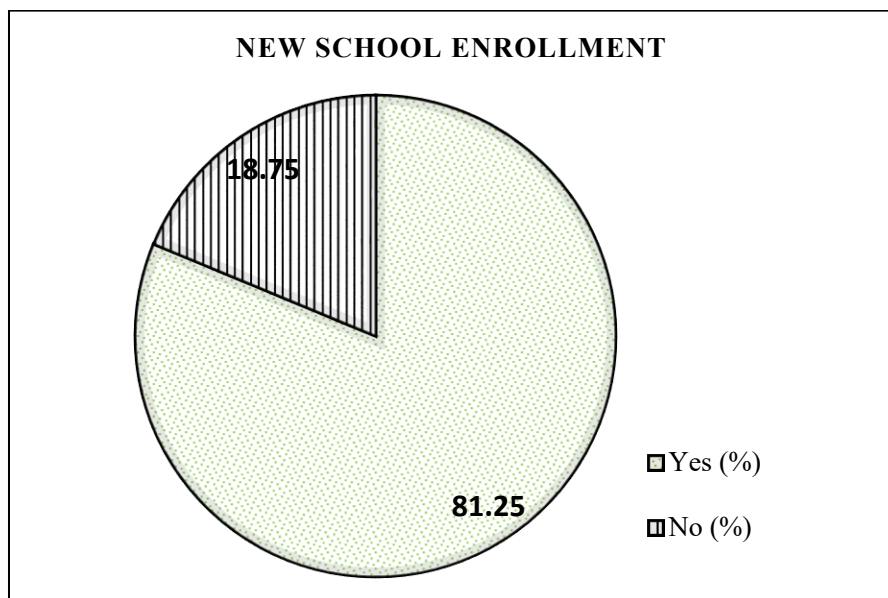


These findings align with the broader body of research on riverbank erosion in Bangladesh, which has shown that displacement often leads to long-term social and economic challenges. The loss of property is not only an immediate crisis but also triggers a cascade of other issues, including reduced access to basic services, deteriorating health outcomes, and increasing poverty (Ali et al., 2021; Islam, 2021).

Education and Livelihood Change as Human and Financial Capital Transformation

Riverbank erosion also exerts significant indirect effects on human capital, particularly through disruptions to children's education. Displacement often interrupts schooling by relocating families far from educational institutions and by increasing economic pressure within households.

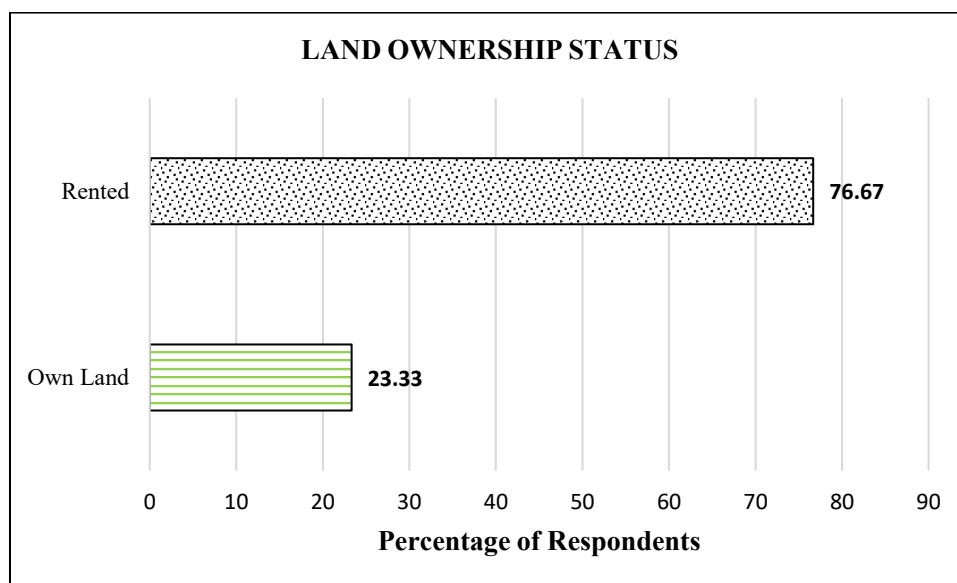
Figure 7 shows that 87.5% of respondents reported educational interruptions lasting more than one year, while only 12.5% experienced disruptions of less than one year. Prolonged educational disruption weakens human capital formation by limiting skill development and future employment prospects. Previous studies have documented similar patterns, noting that displacement frequently leads to higher dropout rates and reduced educational attainment among affected children (Khan et al., 2018; Islam et al., 2020).

Figure 7 Duration of interruptions in education caused by riverbank erosion**Figure 8** New school enrollment of students who were affected by riverbank erosion

Despite these disruptions, some degree of educational recovery was observed. As shown in Figure 8, 81.25% of affected children eventually re-enrolled in school, while 18.75% failed to enroll in a new institution. Although re-enrollment indicates resilience, repeated interruptions may still reduce academic performance and motivation. Teachers interviewed as key informants noted that displaced students often struggle to adapt to new schools, reinforcing the fragile nature of human capital development under conditions of environmental stress. As highlighted by similar studies in rural Bangladesh, prolonged school closures are linked to a higher dropout rate, particularly among girls (Khan et al., 2018).

Changes in housing and livelihood patterns further illustrate the long-term implications of erosion on livelihood sustainability. Figure 9 indicates that 76.67% of respondents currently live in rented houses, while only 23.33% retain ownership of their homes. This shift reflects diminished physical and financial capital, as rented housing offers limited security and increases household expenditure. In response to land loss, many households have shifted from agriculture to informal occupations such as day labor and small-scale trade.

Figure 9 Present land ownership status of the respondents



While this diversification represents an adaptive strategy within the SLF framework, such livelihoods are often unstable and poorly paid, leaving households vulnerable to further shocks (Rahman, 2010; Malak et al., 2021).

Viewed through the Sustainable Livelihood Framework, riverbank erosion in Hatpachil village initiates a cascading process of asset erosion. The destruction of natural and physical capital triggers livelihood shifts that weaken financial stability, disrupt human capital development, and fragment social networks. Although households adopt coping strategies to survive, the absence of strong institutional support limits their ability to convert these strategies into sustainable livelihood outcomes. These findings reinforce the argument that riverbank erosion is not merely an environmental hazard but a driver of long-term social transformation in rural Bangladesh.

The data also suggest a shift in the types of economic activities engaged in by displaced populations. While traditional agricultural practices were once the mainstay of the village economy, many displaced individuals have turned to alternative sources of income such as day labor, small-scale trade, or migration to nearby urban areas in search of work. However, these alternative livelihoods are often less stable and provide lower income, deepening the vulnerability of these households. This shift in livelihood patterns is consistent with findings from other studies in erosion-prone areas, where the loss of agricultural land is associated with a move toward informal and often underpaid labor (Malak et al., 2021). These changes are compounded by the lack of formal training or access to new skills, which further limits the capacity of displaced individuals to recover economically.

Although this study provides valuable insights into the social impacts of riverbank erosion in Hatpachil Village, it is not without limitations. The sample size was limited and the research relied primarily on in-depth interviews (IDIs) and key informant interviews (KIIs). Though it is effective in capturing detailed personal experiences, it may not fully represent the diversity of perspectives such as mental health impacts, gender-specific vulnerabilities, and long-term adaptation strategies across the entire community.

Based on the findings of our research, several recommendations emerge. First, policymakers should prioritize sustainable resettlement programs that ensure displaced households regain access to both homestead and agricultural land, as these resources are critical for long-term survival and dignity (Sarker, 2023). Second, greater investment is needed in educational continuity programs, and local catch-up initiatives, to prevent the intergenerational transmission of poverty caused by disrupted schooling (Mallick & Vogt, 2014). Third, livelihood diversification strategies, including skill-development training and microcredit support, should be promoted to help affected families transition into more stable forms of income. Finally, Policymakers must work to design solutions that address both the immediate and structural impacts of riverbank erosion. Future research should also adopt longitudinal designs to track how households rebuild or adapt over time, which will provide more robust evidence for policy interventions.

Conclusion

Riverbank erosion remains one of the most severe socio-environmental challenges in Bangladesh, and the analysis of Hatpachil village in Shahjadpur Upazila illustrates its far-reaching consequences. This study, drawing on in-depth interviews and key informant insights, highlighted how erosion reshapes community life through displacement, property loss, disrupted education, and shifting livelihoods. Families are repeatedly forced to abandon their homes and cultivable land, losing not only their primary assets but also their sense of stability and continuity. Such displacement undermines intergenerational security and compels many to depend on precarious forms of labor that increases vulnerability. The findings also reveal that education is particularly fragile in erosion-affected areas, as displacement interrupts children's schooling and reduces long-term opportunities for social mobility. These disruptions reinforce cycles of poverty and limit resilience in the face of environmental change. Together, the evidence suggests that riverbank erosion is not simply an environmental hazard but a profound driver of social transformation. Addressing these challenges requires policies that go beyond emergency relief to include long-term rehabilitation, livelihood diversification, and targeted educational support. By analyzing the experiences of Hatpachil residents, this study underscores the urgent need for comprehensive strategies that protect both material resources and social well-being in erosion-prone regions of Bangladesh.

Competing Interests

The authors declared that they have no competing interests.

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