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Article

From subsistence to structural inequality: Poverty, power and resilience in the Haor region of Bangladesh

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Abstract: This paper analyses the transformation of poverty and vulnerability in Bangladesh's haor region through a 26-year longitudinal comparison of participatory poverty assessments conducted in 1999 and 2025 in the villages of Nuralipur (Khaliajuri) and Fadlipur (Gowainghat). Situated within an ecologically fragile wetland system, the study examines how climate exposure intersects with spatial disadvantage, evolving livelihoods, and changing power relations. The findings document significant declines in extreme poverty, improvements in education and infrastructure, and expanded livelihood diversification driven by migration, NGO engagement, and state social protection. However, poverty reduction has unfolded alongside widening inequality. An emergent ultra-wealthy rural elite has consolidated control over land, fisheries, and politically mediated resource flows, reflecting processes of elite capture within local governance structures. Livelihood gains remain uneven and fragile, shaped by differential access to assets, migration networks, and institutional patronage, and highly sensitive to climatic shocks and market volatility. Gender and generational shifts reveal expanding opportunities for women and youth, yet persistent structural constraints across class and religious lines. Conceptualizing vulnerability as a dynamic and relational process mediated by exposure, asset distribution, and institutional power, the study argues that rural transformation in climate-vulnerable regions represents not a linear escape from poverty but a reconfiguration of risk and inequality. Sustainable poverty reduction therefore requires climate-resilient governance that is inclusive, accountable, and attentive to structural disparities.

Keywords: Bangladesh; climate vulnerability; gender relations; haor region; rural poverty

1. Introduction

The haor region of northeastern Bangladesh represents one of South Asia's most climate-exposed wetland ecosystems. Its distinctive hydro-geomorphic landscape—characterized by saucer-shaped depressions that flood during the monsoon and dry out in the winter—supports intensive boro rice cultivation and inland fisheries while simultaneously exposing communities to recurrent flash floods, erosion, and seasonal unemployment. Historically associated with chronic rural poverty and food insecurity, the haor has long exemplified the intersection of ecological fragility and spatial marginality.

Over the past three decades, however, this landscape has undergone profound transformation. National poverty rates have declined, rural infrastructure and market connectivity have expanded, labor migration has intensified, and non-governmental organizations have deepened their presence. State-led initiatives in social protection and climate adaptation—reflected in national planning frameworks such as the Delta

Plan 2100 and the Eighth Five-Year Plan—have further reshaped the governance of rural vulnerability[1]. Yet these shifts raise a critical question: has vulnerability in the haor fundamentally diminished, or has it been reconfigured through new forms of inequality, power concentration, and differentiated resilience?

Much of the existing literature on climate-vulnerable rural regions tends to focus either on persistent poverty traps or on resilience-building interventions. What remains underexplored is how vulnerability evolves over extended periods in contexts where ecological exposure intersects with changing asset distribution, political patronage, migration systems, and gender norms. Most studies offer cross-sectional snapshots of deprivation or adaptation, but few capture how communities move across states of poverty and relative prosperity over time—particularly within ecologically dynamic environments such as the haor.

This paper addresses that gap through a rare longitudinal comparison of two Participatory Poverty Assessments (PPAs) conducted in 1999 and 2025 in the villages of Nuralipur (Khaliajuri sub-district) and Fadlipur (Gowainghat sub-district). By revisiting the same communities using comparable participatory tools, the study traces 26 years of change in livelihoods, institutional engagement, social stratification, and gender relations. The longitudinal design allows for an examination not only of aggregate poverty reduction but also of shifting patterns of differentiation within villages.

The findings challenge linear narratives of rural development. Extreme poverty has declined, educational attainment has improved, and livelihood diversification—particularly through migration and NGO-supported enterprise—has expanded economic opportunity. However, these gains coexist with intensifying inequality. The emergence of an ultra-wealthy rural elite, consolidation of control over fisheries and land, and politically mediated access to state and natural resources illustrate processes of elite capture and uneven accumulation. Progress is therefore real but stratified, and in many cases contingent on access to migration networks, political connections, and institutional patronage.

The paper makes three principal contributions. First, it demonstrates how climate-exposed rural regions can experience simultaneous poverty reduction and structural concentration of wealth, complicating assumptions that vulnerability uniformly declines with economic growth. Second, it reveals the fragility of livelihood gains in the haor, where improvements remain highly sensitive to climatic shocks, health crises, market volatility, and governance quality. Third, it analyses gender and generational shifts, showing that women's education and economic participation have expanded unevenly across class and religious lines, while younger men navigate new aspiration pathways shaped by migration, digital connectivity, and informal economies.

Conceptually, the study treats vulnerability as a dynamic and relational process shaped by exposure to environmental hazards, sensitivity determined by asset distribution and social identity, and adaptive capacity mediated by institutions and power relations. From 1999 to 2025, households did not simply move out of poverty; rather, they repositioned themselves within an evolving structure of risk, opportunity, and inequality. By embedding participatory evidence within debates on spatial poverty, sustainable livelihoods, political economy, and adaptation justice, the paper argues

that rural transformation in climate-vulnerable regions entails not a straightforward escape from deprivation but a reorganization of vulnerability.

The experience of the haor thus reflects broader rural transitions across South Asia, where material deprivation may recede even as structural inequalities persist or intensify. Sustainable poverty reduction in such contexts requires governance systems that are not only climate-resilient but also inclusive, accountable, and attentive to power asymmetries in access to land, labor markets, and public resources.

The remainder of the paper proceeds as follows. Section 2 outlines the integrated theoretical framework guiding the analysis. Section 3 explains the longitudinal participatory methodology. Section 4 presents empirical findings on poverty trajectories, elite formation, livelihood diversification, and gendered transformation. The final section discusses implications for resilience policy and adaptation justice in ecologically fragile rural regions.

2. Theoretical framework

The analysis of changing livelihoods, institutions, and gender relations in the haor region is grounded in an integrated theoretical framework combining spatial poverty theory, the sustainable livelihoods approach, and critical perspectives on rural inequality, gender, and governance.

Spatial poverty theory highlights how geography shapes poverty trajectories, particularly in ecologically fragile and isolated contexts such as the haor [1,2]. Remoteness, recurrent flooding, and limited connectivity generate "regional poverty traps," where marginalization and entrenched social hierarchies constrain access to markets and public services. These dynamics are visible in Khaliajuri and Gowainghat, were spatial disadvantage compounds social exclusion.

The sustainable livelihoods framework [3] provides a lens to understand how households mobilize assets and strategies to manage vulnerability. In the haor, diversification through migration, NGO involvement, and small enterprises has strengthened resilience to seasonal and climatic shocks. Yet, as the findings show, livelihood security remains stratified: households with migration networks or NGO membership experience upward mobility, while others remain excluded.

Insights from the political economy of rural development [4] explain the consolidation of elite control over resources such as fishing rights, stone extraction, and safety net distribution. These forms of elite capture demonstrate how governance reforms lacking accountability may perpetuate inequality rather than mitigate it.

A feminist political economy perspective [5] informs the gender analysis, revealing both progress and constraint. Women's engagement in education, microfinance, and savings groups has enhanced their visibility and confidence, yet persistent burdens of unpaid care and limited decision-making authority underscore the structural nature of gender inequality. This pattern reflects regional debates on "empowerment without transformation."

Vulnerability is conceptualized as a dynamic and relational process shaped by exposure to hazards, sensitivity influenced by asset distribution and social identity, and adaptive capacity mediated by institutions and power relations. Climate vulnerability and adaptation theory [6] further underscores how power structures

determine who bears risks and who benefits from resilience-building efforts. Although national initiatives such as the Delta Plan 2100 and the Eighth Five-Year Plan prioritize infrastructural resilience, insufficient attention to social inclusion may reinforce existing hierarchies. As a result, poor households, female-headed families, and minority groups remain disproportionately exposed, underscoring the need to align climate adaptation with social protection and equity-oriented governance. Together, these perspectives justify adopting PPA as a methodological approach that links structural theory with lived experience. By foregrounding local voices, PPA uncovers how geography, livelihoods, elite power, gender, and climate vulnerability interact to shape poverty outcomes [7]. Shown in **Table 1**, this framework offers a clear foundation for analyzing uneven transformations in Khaliajuri and Gowainghat, positioning the study within ongoing discussions in South Asia about rural poverty, inequality, and development.

Table 1. Theoretical dimensions guiding the study.

Theory	Core assumptions	Application to this research (haor context)	Relevance to PPA
Spatial poverty theory	Poverty is geographically concentrated; remoteness and poor connectivity trap communities in chronic deprivation.	haor communities' isolation, recurrent flooding, and lack of infrastructure constrain access to markets, services, and state resources, reinforcing marginalization.	PPA captures locally articulated experiences of spatial exclusion, demonstrating how geography intersects with social hierarchies to limit opportunities.
Sustainable livelihoods approach	Households mobilize diverse assets (natural, physical, social, financial, human) to manage risks and pursue well-being; resilience depends on asset access and institutional context.	Livelihood diversification in haor villages—migration, NGO-based microfinance, small-scale enterprises—reflects adaptation to seasonal vulnerability, but remains stratified by access to assets and networks.	PPA reveals household-level strategies, showing both pathways of upward mobility and persistent vulnerabilities across different social groups.
Political economy of rural development & elite capture	Decentralization and resource reforms often reinforce elite power; rural governance is shaped by patron–client relations and capture of state/NGO resources.	Ultra-rich households in Khaliajuri and Gowainghat consolidate power by monopolizing fishing rights, stone trade, and political connections, shaping access to livelihoods and benefits.	PPA documents lived experiences of corruption, exclusion, and inequality, exposing how institutional capture undermines inclusive poverty reduction.
Feminist political economy	Gender norms constrain women's agency, but access to education, collective action, and labor markets can expand opportunities in uneven ways.	Women in haor villages have gained visibility through savings groups, microcredit, and NGO engagement but continue to face unpaid care burdens, limited decision-making, and vulnerability to gender-based violence.	PPA surfaces women's voices on empowerment and vulnerability, providing grounded insights into how gendered inequalities persist despite developmental gains.
Climate vulnerability & adaptation theory	Vulnerability is socially differentiated; adaptive capacity depends not only on infrastructure but also on social equity and institutional support.	Despite national climate adaptation priorities, poorer and female-headed households in the haor remain disproportionately exposed to flash floods, crop losses, and insecure housing.	PPA highlights local perceptions of risk, adaptation strategies, and inequities in access to climate-resilient infrastructure and relief measures.

The study's findings within this theoretical framework address global debates on resilience politics and poverty 'graduation' sustainability [8]. Literature increasingly shows that poverty reduction can conceal new forms of structural insecurity when livelihoods rely on unpredictable labor migration, financialization, or climate-sensitive markets [9]. The haor case exemplifies this concern: mobility and NGO-supported asset building have facilitated upward mobility, but these improvements remain vulnerable to floods, illness, or political exclusion. Additionally, the rise of

ultra-wealthy households in a climate-vulnerable periphery challenges typical narratives of rural "poverty traps." Instead of stagnation, there is a polarized transformation—a scenario where a small elite accumulates wealth while most face fragile progress. This indicates that adaptation justice should address not only exposure but also the distribution of power, land, and institutional access within rural communities.

3. Research methodology

3.1. Longitudinal participatory poverty assessments

The research draws on PPAs conducted in 1999 and 2025 in Nuralipur and Fadlipur villages in the haor region. Nuralipur is in Khaliajuri sub-district of Netrokona district, whereas Fadlipur is in Gowainghat subdistrict of Sylhet district. The 1999 study, part of the NGO Working Group on the World Bank's participatory monitoring initiative, followed the Consultations with the Poor framework [10], applying a consistent thematic scope across four domains: (i) well-being and ill-being; (ii) problems and priorities; (iii) institutional relationships; and (iv) gender relations. The PPA in 1999 also contributed both to the World Development Report 2000/01 and the formulation of Bangladesh's Poverty Reduction Strategy Paper (PRSP).

The study adopted a longitudinal Participatory Rural Appraisal (PRA) design, replicating core tools first applied in 1999 and systematically revisiting them in 2025 to enable structured comparison over a 26-year period. PRA techniques were implemented in gender- and age-disaggregated groups, with dedicated sessions for women to ensure the inclusion of gender-specific perspectives. Each session typically involved 15–20 participants, purposively mobilized through gender- and youth-specific criteria to ensure broad representation and to create socially comfortable spaces for participation. Separate groups were convened for men, women, and youth (including adolescent girls where relevant), thereby encouraging open dialogue and reducing hierarchical constraints.

The target population comprised all villagers. In 2025, all available participants from the 1999 study were encouraged to rejoin the participatory sessions alongside newly formed households, ensuring both longitudinal continuity and reflection of demographic change. In addition, ten in-depth life histories were conducted in 1999; seven of these original participants were revisited in 2025, and five new cases were added to capture emerging socio-economic dynamics. Sessions followed a sequenced participatory process beginning with rapport-building exercises and concluding with community-level validation and triangulation of the findings. **Table 2** summarizes the PRA tools, their application across both time points, and group composition.

Table 2. PRA tools applied in 1999 and 2025.

PRA tool	1999 Application	2025 Revisit and adaptation	Group composition / notes
Transect walk & rapport building	Systematic village walk with community members to understand settlement patterns, resources, and livelihoods.	Revisited sites with earlier participants (where possible); used photographs to stimulate recall; mapped spatial and socio-economic changes; engaged new local leaders.	Conducted with mixed community members in both villages.

Table 2. (*Continued*).

PRA tool	1999 Application	2025 Revisit and adaptation	Group composition / notes
Social mapping	Community-drawn maps identifying households, resources, infrastructure, and social layout.	1999 maps shared and collectively redrawn to reflect current realities and demographic shifts.	Mixed groups (men, women, youth). Used for collective reflection and rapport building.
Well-being ranking, scoring & trend analysis	Community-defined well-being categories; household classification followed by Focus Group Discussion (FGD) to interpret criteria and trends.	Reapplied to compare changes in wealth structure, mobility, and emerging elite groups.	Separate male and female groups in both years and villages.
Problem listing & priority ranking	Identification and ranking of key livelihood, environmental, and social challenges; followed by FGD.	Repeated to assess shifts in risk, vulnerability, and development priorities.	Separate groups of men, women, and youth in both years.
Institutional ranking & scoring	Participatory assessment of formal and informal institutions based on access, trust, and influence.	Reapplied to examine changes in institutional presence, NGO engagement, and political mediation.	Separate male and female groups in both years.
Gendered workload & decision-making chart	Mapping of daily activities and household decision-making to assess gender roles.	Repeated to capture generational and normative shifts in labor division and authority.	Separate groups: men, women, adolescent girls (both years).
Life histories / Case studies	10 in-depth life histories (poor women/men, youth, upwardly mobile individuals).	7 original participants revisited; 5 new cases added to capture emerging dynamics (total = 12).	Longitudinal comparison where possible.
Community triangulation session	Findings presented in open village meeting for validation and collective reflection.	Repeated to verify interpretations and include those not present in earlier sessions.	One plenary session per village in each study year.

3.2. Village selection for participatory poverty assessments

In 1999, village selection employed purposive sampling criteria to ensure relevance, operational practicality, and diversity of perspectives. In both Khaliajuri and Gowainghat, villages were evaluated based on programmed exposure (such as involvement in developmental activities), population size, accessibility from the sub-district headquarters, communication infrastructure, and safety of fieldwork. In Khaliajuri, villages with ongoing earthworks related to flood rehabilitation were excluded to prevent interference with wage labor participation and to ensure availability for PRA sessions. Very small villages (30–35 households) were avoided due to limited socio-economic diversity, while very large villages (>200 households) were excluded to preserve analytical coherence. Consequently, a moderately sized village (75–120 households) with river access, Nuralipur[2], was selected. In Gowainghat, similar criteria were adopted, including safety precautions and considerations of resistance to participatory exercises. A village of about 100 households, Fadlipur[3], was chosen. Together, Nuralipur and Fadlipur illustrate both the common structural constraints of the haor ecology and the divergent trajectories shaped by settlement histories, religious demography, and geographic connectivity. These same villages were revisited in 2025.

In 1999, the study in Nuralipur village (February 18–24) and Fadlipur village (March 1–7) was led by the first author, with the second author serving as a team member. In 2025, the original researchers revisited the same sites, accompanied by a

research assistant, the third author, who conducted fieldwork in Nuralipur (15–22 April) and Fadlipur (26–30 May). The identical scope and methods ensured comparability across time.

3.3. Reflexivity on power dynamics and participation

Considering the study's focus on elite capture and patron–client relationships, careful attention was given to managing local power dynamics during participatory sessions. Community members identified as part of the economically or politically dominant "elite" groups did not take part in group PRA exercises. This was a deliberate methodological and ethical decision to reduce hierarchical pressure and foster open discussion among ordinary households. Participants could openly discuss elite influence, institutional access, and local inequalities without the presence of authority figures.

To further reduce power imbalances in certain participatory exercises, sessions were held in gender-segregated groups, with dedicated spaces for women and youth. These setups aimed to create socially safe environments and lessen restrictions stemming from gender or social hierarchies. Conversely, local elites were engaged individually through one-on-one discussions to gather their views on institutional change and community development. This tailored approach to engagement balanced inclusiveness, ethical considerations, and analytical depth, all while preserving the participatory nature of the research.

3.4. Documentation quality and longitudinal recall

To mitigate potential recall issues over the 26-year span, the study used extensive archival data from the 1999 fieldwork. The initial phase produced detailed reports, PRA charts (such as social maps, well-being rankings, and institutional diagrams), session notes, and photographs. These records were systematically stored and reviewed in 2025, ensuring that the longitudinal comparison relied on recorded data rather than memory alone.

The 2025 fieldwork adhered to the same strict documentation protocols, such as detailed process notes, digitized charts, and photographs of exercises. Visual materials from 1999 were also employed during community sessions as prompts for recall, supporting collective reflection and the validation of previous results.

The study's continuity was reinforced by involving two key researchers, including the lead, across both phases. This approach helped maintain contextual understanding and ensured consistent analysis. Overall, systematic documentation combined with researchers' continuity improved transparency, comparability, and methodological reliability, all while preserving the study's participatory nature.

3.5. Research questions

This longitudinal study examined poverty and well-being dynamics in the haor region over 26 years through the following guiding questions:

i. How have the definitions of well-being and ill-being changed from 1999 to 2025, and what material, social, and aspirational factors support these changes?

ii. How have poverty profiles, mobility patterns, and coping strategies evolved, and what do these changes indicate about household resilience?
iii. How have issues like drug abuse, gambling, domestic violence, dowry, and discrimination against women and minorities developed or changed over time?
iv. What opportunities have emerged for livelihoods, education, and mobility, and how does access to natural resources differ among groups and genders?
v. How have relationships with formal and informal institutions evolved, and what variations are there in perceptions of their impact, trustworthiness, and authority?
vi. How have gender roles, decision-making, and community participation changed over time, and what obstacles to equality still exist?

These questions collectively underpin the study's analysis of changing poverty dynamics in the haor, providing both a historical perspective and relevance for current policies.

4. Findings and discussions

4.1. Determinants of well-being and ill-being: Then and now

4.1.1. From survival to exclusion: Shifting perceptions and drivers

From 1999 to 2025, the concepts of well-being and ill-being in Nuralipur and Fadlipur evolved from primarily survival-focused definitions based on material sufficiency to more complex, multidimensional understandings influenced by aspirations, opportunities, and resilience. This shift was propelled by factors such as climate stress, migration, education, technological spread, and changing gender and generational norms.

In 1999, perceptions of well-being included food security, cultivable land, durable housing, and productive assets such as cattle, boats, and fishing nets—reflecting subsistence-oriented views common in rural South Asia [11,12]. Equally important were avoiding debt, obtaining formal credit, and maintaining social respectability. Education was mainly valued for sons, while women viewed well-being through male income, protection from violence, and support in old age, mirroring patriarchal norms in India and Bangladesh. Ill-being was linked to landlessness, reliance on insecure daily wages (din ane, din khay), fragile thatched homes, chronic debt, poor health, and stigma. Female-headed households faced the highest risks, a pattern consistent with South Asian findings.

By 2025, perceptions shifted in line with regional changes from subsistence to opportunity-driven measures. Prosperity became more closely associated with diverse income sources, higher education for both boys and girls, access to healthcare, digital connectivity, and resilience to climate-related shocks. Women linked well-being to self-help groups, legal support, and freedom from domestic violence, while youth focused on mobility, digital access, and vocational training—mirroring evidence from Bangladesh, India, and Nepal on collective action and microfinance [13]. Conversely, feelings of deprivation stemmed from exclusion from new opportunities rather than a scarcity of resources. Educated but unemployed youth faced the "education–

employment mismatch" common across South Asia [14]. Those lacking access to migration, NGO support, or digital tools perceived themselves as "left behind," while recurrent floods and erosion exacerbated insecurity, as reflected in Nepal's floodplains and India's delta regions. Migration acted as both a coping mechanism and a form of mobility, with remittances supporting housing and education—though unevenly, which contributed to increased social stratification [15]. Meanwhile, mobile phones and the internet broadened horizons but heightened awareness of inequality. Gender norms evolved unevenly; younger women increasingly pursued education, delayed marriage, and sought dignified employment—similar to broader South Asian youth trends [14]—yet structural barriers to mobility, employment, and safe workplaces persisted. Older women remained focused on stability and protection from violence.

Overall, as presented in **Table 3**, the transition from 1999 to 2025 reflects a broader South Asian trajectory: poverty and well-being are increasingly defined by access to opportunities, resilience to shocks, and inclusion in areas such as education, migration, and institutional support, rather than just subsistence and material sufficiency. Simultaneously, emerging forms of exclusion—such as from labor markets, digital resources, or social protection—have intensified divisions, highlighting the complex relationship between poverty reduction, inequality, and resilience in the haor region.

Table 3. Comparative chart capturing communities' evolving experiences of well-being and ill-being.

Dimension	1999 Well-being	2025 Well-being	1999 Ill-being	2025 Ill-being
Food	Three meals/day	Nutrition diversity, clean water, less seasonal hunger	Daily food insecurity	Same + food adulteration, climate-induced crop loss
Assets	Tin house, cattle, land	Concrete house, appliances, mobile phone	No land, broken house	Flood damage, still no land ownership
Work	Farming, fishing	Diversified livelihoods incl. migration, business	Daily wage labor	Educated but jobless, unskilled youth
Social status	Village Salish[4]	Community leadership, NGO forums	Excluded, invisible	Socially visible but economically excluded
Education	Literacy, sending sons to school	Girls in school, aspirations for jobs	Illiterate, girls excluded	Dropouts due to poverty, educated unemployment
Gender norms	Women as supporters	Women as earners, leaders	Widows/ abandoned women suffer	Gender-based violence, limited job access for women
Risks	Erosion, illness, dowry	Floods, climate change, price shocks	Debt, hunger, loss of honor	Same + mental stress, migration failures
Hope	Sons' employment	Education, training, NGO support	Fatalism	Mistrust in institutions, frustration among youth

4.1.2. Transformation of well-being categories and household distribution

Between 1999 and 2025, perceptions of well-being in the haor region shifted from simple survival-based categories to more complex, multidimensional ones. Early classifications focused on physical assets and daily consumption, while later perspectives incorporated education, connectivity, and resilience. Household distributions across these categories also changed, reflecting both social mobility and new vulnerabilities, especially after climate shocks and social shifts.

The total number of households in the study villages was 177 in 1999 and

increased to 402 in 2025, reflecting the overall demographic growth in Bangladesh. As shown in **Table 4**, in 1999, well-being categories ranged from "happy families" with food security and assets to "hardcore poor" households experiencing starvation and lacking access to credit. More than two-thirds of households were in the poorest groups. By 2025, the percentage of chronically vulnerable households fell sharply to 6%, replaced by a growing number of "secure and advancing" (45%) and "progressing but precarious" (22%) households. A small ultra-rich group (1%) appeared, controlling significant high-value resources.

Table 4. Comparative well-being categories in the haor region, 1999 and 2025.

1999 Categories	Criteria	Household proportions (Number)	2025 Evolved categories	Criteria	Household proportions (Number)
-	-	-	Ultra rich	Multiple high-value income sources and assets; strong political and law enforcement connections; control over natural resources; formal banking.	1% (4)
Happy families	Year-round food security; good-quality tin-shed housing; cattle ownership; good clothing; no loan dependence; children's education ensured; respected locally; easy credit access.	8% (14)	Secure and advancing families	Permanent housing with electricity and amenities; cattle ownership; able to give interest-free loans; strong local elite links; access to leased resources (water bodies, quarries); good clothing; stable livelihoods.	45% (181)
Moderately poor	Engage in sharecropping; own some land; food secure ≥3 months/year; modest credit access; large thatched housing; 2–3 cattle and poultry; modest but decent clothing.	20% (35)	Progressing but precarious	Diversified income (land, sharecropping, trade, remittances); food secure most of the year; store food ≥3 months; semi-permanent housing with electricity; cattle, small boats; MFI access; smartphones/ internet; children educated.	22% (88)
Poor families	Hand-to-mouth subsistence; basic diet; dependent on fishing, day labour, agriculture; no livelihood assets; dilapidated housing or on others' land; both spouses and children work.	44% (78)	Struggling and stagnant	Three meals/day but poor-quality semi-permanent housing; skilled/unskilled labor (stone collection, machinery, fishing); only homestead land; travel for work; MFI access; cell phones; children in school but working seasonally.	26% (105)
Hardcore poor	Frequent starvation; no earning male members; women as main earners; one earner supports many dependents; live on others' land in poor, disaster-prone housing; low-quality clothing; excluded from NGO loans.	28% (50)	Chronically vulnerable and socially excluded	Women-led households; husbands often ill; occasional skipped meals; one earner, many dependents; basic fishing with small nets; few poultry/ducks; limited MFI access; homestead gardening, irregular income; occasional begging or labor-for-loan; rare mobile phone access.	6% (24)

Case study 1: From hardcore poor to precarious progress

In 1999, Meher's (pseudonym) life in Nuralipur village was marked by acute hardship. After the 1998 flood washed away her home, she lived in a small hut on low-lying land, caring for young children with no income of her own. Her husband searched daily for wage labor, and meals were uncertain. At that time, her family's survival depended entirely on his irregular earnings. By 2025, her circumstances have changed, though not without struggle. Together, she and her husband rebuilt their home, investing BDT 100,000 (approximately USD 820) through savings and loans.

When high-interest debt became burdensome, they refinanced through an NGO loan, which they now repay in monthly instalments. Four of her five children are married; one daughter occasionally supports her financially, while two sons remain nearby and contribute informally. Her youngest son, aged 12, is still in school—something she takes pride in. Meherjan's journey reflects persistence, shared family effort, and careful financial juggling to maintain a more secure, yet still fragile, stability.

Case study 2: From land insecurity to transnational livelihood

In 1999, Biswas (pseudonym), aged 13, worked as a seasonal day laborer in Fadlipur after leaving school in Class Two. His family, a Hindu minority household, had lost most of their land following protracted legal disputes and intimidation by a local influential figure. With only one bigha of land—eventually mortgaged—and heavy debt to moneylenders at high interest, the family survived through fishing and agricultural wage labor, facing months of seasonal unemployment. Education was discontinued for most siblings due to financial hardship. By 2025, Nikhil's trajectory had shifted significantly. Migrating to Oman as a chef, financed through an NGO loan (since repaid), he now remits BDT 10,000–15,000 (approximately USD 80 -120) monthly. His two sons attend school (Classes 8 and 3), reflecting a break from his own interrupted education. His brothers are engaged in masonry and agriculture, and the extended family lives together in improved economic stability. Migration has reconfigured the household's wellbeing and social standing.

As depicted in Case Study 1 and 2, this upward trend reflects the combined effects of livelihood diversification, remittances, microfinance, infrastructure enhancements, and digital connectivity. However, structural inequalities have worsened. The control of leased water bodies and stone extraction rights—often facilitated through political patronage—has led to resource concentration, restricting fair access to new opportunities. For the 26% of households considered "struggling and stagnant," livelihoods remain fragile, heavily dependent on seasonal work and susceptible to climate and market changes.

Overall, the data show a shift from survival-based livelihoods to a more divided socio-economic landscape, with fewer people in extreme poverty, an expanding middle class of moderately secure households, and a small yet influential economic elite that holds disproportionate sway over local resources and governance.

4.1.3. Decline in extreme poverty and emergence of new inequalities

From 1999 to 2025, Nuralipur and Fadlipur experienced significant reductions in extreme poverty, mirroring broader changes across rural Bangladesh and South Asia. In 1999, widespread deprivation was evident: many households faced ongoing food shortages, lived in fragile homes susceptible to floods, and lacked productive assets. These conditions align with rural poverty research in Bihar and Uttar Pradesh, India, where extremely poor families were stuck in cycles of low-wage work, debt, and food insecurity [12].

By 2025, the severity and visibility of such poverty had significantly decreased. Multiple factors contributed to this change. The expansion of NGO efforts in the haor—especially through microcredit, skills training, and women's savings groups—reflects similar trends across Bangladesh, where NGO-led development has played a key role in reducing poverty [16,17]. Remittance inflows, both domestic and

international, have helped households invest in durable housing, land, and livestock, aligning with broader evidence that migration and remittances are vital drivers of rural mobility in South Asia [18]. Social protection programs—such as stipends for widows and the elderly, as well as school stipends—have offered an additional, though uneven, safety net.

The 2025 data show that many households once stuck in extreme poverty have now shifted to a "near-poor" status, characterized by basic food security, tin-roofed houses, and mobile phones as signs of improved living conditions. Similar trends are observed in rural Nepal and Sri Lanka, where better access to education and technology has created new opportunities beyond subsistence farming [19]. However, upward mobility remains uneven. Households that lack access to natural resources, migration options, NGO membership, or political connections are still vulnerable to shocks. Specifically, in the haor region, climate-related risks like flash floods threaten these fragile improvements, reflecting the broader issue of environmental instability in wetland economies.

Although the haor region shows increased socio-economic differentiation since 1999, issues like growing inequality and emerging digital divides reveal that poverty reduction has been incomplete and dependent on certain factors. As noted in broader studies on rural South Asia, structural transformation involves more than just rising incomes; it also needs fair access to resources, information, and institutional backing [20]. The haor example underscores this point, demonstrating progress alongside ongoing risks of regression.

4.1.4. The ultra-rich and resource governance

By 2025, a small yet influential group of ultra-wealthy households had developed in the haor region, reflecting broader South Asian trends of resource commercialization, political support, and regional market integration [21]. Despite their limited numbers, these households hold significant sway over natural resource management, markets, and local institutions.

In Khaliajuri, elites strengthened their wealth by controlling access to public water bodies (jalmohals) through political connections and administrative influence. In Gowainghat, wealth was accumulated through the profitable sand and stone trade, with elites managing labor recruitment, cross-border negotiations, and profit distribution- practices similar to rent-seeking in the mineral and forest sectors of India and Nepal [22].

These extremely wealthy households invested in various sectors such as land, transportation, and political networks. They used conspicuous consumption- like luxury homes, mechanized boats, and storage facilities- to symbolize and reinforce their authority. Patron–client relationships remained vital to their power [23], with philanthropy, including mosque donations and flood relief efforts, functioning more as tools of control rather than means of equitable redistribution. Similar to other agrarian transitions [24], their emergence coincided with a reduction in extreme poverty but also deepened new inequalities, raising concerns about inclusive governance and fair resource distribution.

4.2. Evolving opportunities, livelihoods, and vulnerabilities

4.2.1. Shifting opportunity structures

Between 1999 and 2025, the landscape of opportunity and mobility in Khaliajuri and Gowainghat underwent considerable evolution, mirroring broader rural changes in South Asia. In the late 1990s, livelihoods were primarily based on seasonal farming, fishing, and casual wages, with restricted access due to elite control over Khas land and fishing rights. Women and adolescents faced even greater constraints: girls seldom attended school, women were mainly engaged in unpaid domestic chores, and early NGO literacy programs were just beginning to grow [25]. The potential for upward mobility was delicate, often involving small gains, such as a tin roof or livestock, but was vulnerable to setbacks from floods or illness [26].

By 2025, the opportunity landscape had become more diverse, influenced by migration, NGO initiatives, educational growth, and the spread of technology. Migration became a key livelihood strategy, helping to build assets but also leading to debt and insecurity, similar to experiences in Bihar and Nepal [27]. Remittances have altered consumption patterns and social hierarchies, as observed in other South Asian regions [28]. NGOs expanded women's engagement in the local economy through activities such as homestead gardening, livestock and poultry rearing, and small-scale trade, which improved nutrition and increased their decision-making roles. Education emerged as a critical route to mobility for younger generations, although it was limited by weak job markets.

Access to mobile phones and digital technologies has expanded engagement with markets, finance, and information, while awareness of rights and entitlements has increased due to the efforts of NGOs and governments. However, the advantages of technological and institutional changes have been uneven, creating "mobility divide" [4] Households with migration networks, education, or NGO links have experienced upward mobility, whereas others remain stuck in insecure livelihoods and high vulnerability. Social recognition has reflected these divisions, granting status to educated households and those connected with NGOS, while marginalized and impoverished groups remain excluded [29].

Overall, opportunity structures in the haor region have evolved from limited subsistence livelihoods to more diverse yet stratified mobility pathways, demonstrating how rural transformation broadens opportunities while also reinforcing inequalities related to class, gender, and connectivity.

4.2.2. Persistent challenges and adaptive coping

Between 1999 and 2025, the haor region's vulnerability landscape underwent complex changes, with long-standing structural issues exacerbated by emerging risks. Persistent problems, such as seasonal unemployment, elite resource capture, debt, insecure housing, and limited education, have evolved into new forms. Educated unemployment became a significant issue, illustrating a mismatch between increasing educational attainment and limited job opportunities—similar to trends elsewhere in South Asia [14]. Climate change has intensified risks, leading to frequent flash floods, erosion, and crop failures [30]. At the same time, population growth increased pressure on fragile land and water resources, speeding up landlessness, exclusion, and

outmigration. Although less emphasized in 1999, by 2025, population growth had become a key factor in vulnerability. Demographic pressures strained resources, exacerbated landlessness, intensified competition, and accelerated ecological damage. In densely populated areas, these stresses reinforced cycles of exclusion and drove outmigration, creating more complexity in local resilience efforts.

New stressors increased vulnerability. One of the main concerns was widespread over-indebtedness, often related to migration and microfinance borrowing, reflected regional critiques of financialization in South Asia [31]. Digital divides excluded poorer households from new opportunities, further worsening inequality. Environmental health risks, notably arsenic contamination of groundwater, became critical issues in Khaliajuri and Gowainghat, impacting drinking water safety and overall well-being. Concurrently, mental health problems—related to exclusion, divorce, polygamy, and unemployment—highlighted psychosocial stress in insecure rural labor markets. Disparities in benefits from migration and NGO initiatives, along with perceptions of corruption, undermined social cohesion and trust in governance.

Coping mechanisms evolved over this period. In 1999, households primarily employed subsistence strategies, such as informal borrowing, advance labor agreements, asset sales, and kinship reciprocity, which provided immediate relief but often increased vulnerability. By 2025, these strategies became more monetized and mobility-focused. Migration served as both proactive and reactive risk management, consistent with wider South Asian trends on mobility as a coping strategy [27]. Access to microfinance, savings groups, and mobile financial tools boosted liquidity but also raised the risk of debt dependence [31]. Digital technologies enabled remittances and early warning systems, yet poorer, digitally excluded households still relied on traditional coping methods.

Overall, the ongoing presence of structural deprivation, alongside emerging environmental and psychosocial risks, and the uneven implementation of adaptive strategies, suggests that resilience in the haor remains fragile and unevenly distributed. The advantages of change tend to be concentrated among better-connected households.

4.2.3. Expansion of high-risk livelihoods

In 1999, the primary risks were environmental, mainly involving fishing or farming during floods—similar to risks faced in rural Odisha or coastal Andhra [32]. By 2025, new high-risk livelihoods emerged due to resource depletion, market pressures, and structural inequalities. Fishing, once a risky activity mainly during seasonal floods, now involves extreme methods: some fishermen dive up to 20 feet using homemade oxygen cylinders, risking accidents and health problems. Increased competition, resource loss, and water body monopolization intensify these dangers.

Migration—whether to cities or abroad—offers increased income, but it also entails risks like recruitment scams, unsafe working conditions, debt, and deportation. These challenges highlight broader regional patterns in South Asia, where the pursuit of higher wages has led to new vulnerabilities and forms of exploitation [33].

In Gowainghat, the sand and stone extraction industry has become a significant source of cash income, but it remains unregulated and hazardous. Workers face dangers such as physical injuries, silicosis, and sudden collapses of quarry walls.

These problems are worsened by political patronage and elite influence, illustrating resource-driven labor exploitation common in South Asia [22]. Similarly, informal cross-border trade exposes participants to risks such as arrest, confiscation, and exploitation by intermediaries, despite providing an essential income.

Overall, while livelihoods have expanded, the nature of risk has shifted—from mainly environmental hazards in 1999 to a broader range of market-related and politically influenced vulnerabilities in 2025.

4.2.4. New social ills: Rise of drug abuse, gambling, and cross-border trafficking

By 2025, social problems like drug abuse, cross-border trafficking, and online gambling have become especially prominent, showing a clear shift from the issues of structural poverty and seasonal unemployment that were prevalent in 1999. These changes also reflect a shift in social cohesion, similar to patterns seen in other South Asian borderland economies [34]. In Nuralipur, the rise of Yaba (methamphetamine), alcohol, and other substances has created serious threats at both household and community levels. Meanwhile, in Fadlipur, its closeness to the international border has facilitated trafficking networks that not only smuggle illegal drugs but also involve local youth and women in the process. Often controlled by politically connected or financially powerful individuals who avoid responsibility, these issues, which were not present in 1999, have added complex economic, social, and governance challenges, increasing household vulnerabilities and weakening community ties.

The impact on households is severe: Addiction and gambling deplete income, increase debt, and often lead to the sale of productive assets. These issues escalate domestic tensions, with women and children suffering from neglect and violence. Meanwhile, gambling has become a parallel source of vulnerability, trapping young men in debt cycles and reinforcing economic insecurity.

At the community level, drug abuse, trafficking, and gambling collectively harm trust, increase social stigma, and weaken social cohesion. In Gowainghat, trafficking networks influence local politics, further damaging institutional credibility. These issues highlight emerging vulnerabilities driven by global flows, local power dynamics, and changing youth involvement. To tackle these challenges, efforts must extend beyond law enforcement to include prevention, rehabilitation, and economic support for vulnerable populations.

4.2.5. Minority well-being and religious dynamics

In 1999, Hindu minority households faced systematic exclusion from land and fishing rights, political marginalization, and gender-targeted harassment [35]. By 2025, some areas showed a reduction in overt religious tensions, but demographic changes were evident: Nuralipur no longer had a Hindu population, and Fadlipur's minority numbers had significantly decreased. Economic improvements among remaining minority households were often due to migration rather than better access to local resources. While coexistence had improved where minorities still resided, underlying drivers of exclusion persisted and were more effectively countered through outmigration than through structural change. This pattern aligns with broader South Asian trends, where religious minorities increasingly depend on migration and remittances as survival strategies amid structural marginalization [36].

4.3. Shifting power and trust

Table 5 summarizes institutional changes in the haor region from 1999 to 2025, based on longitudinal data from Nuralipur and Fadlipur. It outlines the development of four key areas: the institutional landscape, trust and participation, corruption and elite influence, and crisis response strategies. The comparison reveals a move away from traditional, elite-centered, socially embedded structures toward a more diverse, formalized, and tech-enabled system. While NGOs, community groups, and digital platforms have broadened participation and resilience, access remains unequal, influenced by political favoritism, gender norms, and ongoing inequalities. This overview offers a clear reference for understanding institutional transformation in the haor over time and its effects on governance, equity, and community well-being.

Table 5. Comparative evolution of institutions in the haor region (1999–2025)

Dimension	1999	2025	Key shifts
Institutional landscape	Dominated by village elders, Salish, religious leaders, and kinship networks; NGOs and formal government peripheral.	Pluralistic mix of NGOs, local government, women's groups, youth collectives, and digital platforms alongside traditional institutions.	Expansion from socially embedded authority to multi-actor governance; greater visibility of formal and digital actors.
Trust & participation	Trust concentrated in family, religious leaders, and elders; formal bodies distrusted; women absent from decision-making spaces.	NGOs and community based groups among most trusted; modest female participation via savings groups and training; political patronage still limits fairness.	Shift from male-only, elite-dominated spaces toward partial inclusivity; women's voice and presence improved but remain uneven.
Corruption & elite capture	Transactional governance; overt bribery for services; law enforcement linked to harassment and fabricated charges; minority exclusion.	Politically networked corruption embedded in elite–resource control alliances; informal fees persist; elite influence and capture of safety nets and natural resources respectively.	Move from overt coercion to institutionalized patronage; deepened structural inequalities despite procedural formalities.
Crisis response	Reactive, elite-mediated relief via elders, mosques, and kin; limited NGO engagement; politicized Union Council[5] relief distribution.	Multi-actor system: NGOs lead emergency aid and resilience-building; local govt more engaged; digital cash transfers, early warnings; women/youth groups active in response.	Transition from ad hoc relief to integrated resilience strategies; improved speed and scope but political capture and digital exclusion persist.

4.3.1. Transformation of the institutional landscape

As presented in **Table 5**, between 1999 and 2025, the institutional environment of the haor communities shifted from a reliance on socially embedded, locally mediated structures to a more pluralistic and interconnected system involving traditional, formal, and digital actors, echoing broader rural transformations in South Asia where local authority structures are increasingly hybridized, overlapping, and contested [37].

In 1999, the institutional landscape in Khaliajuri and Gowainghat was characterized by kinship networks, village elders, Salish committees, and religious leaders. These informal entities handled disputes, land access, and marriage arrangements, although their legitimacy was often undermined by elite bias—an issue also observed in rural West Bengal, Bihar, and northern Bangladesh [26]. State

institutions, such as the Union Council and Police Stations, remained marginal, limited by corruption, patronage, and seasonal inaccessibility, while NGOs were emerging but still on the fringes, a finding similar to those in early microcredit research [16].

By 2025, the institutional landscape had become more diverse and interconnected. NGOs expanded their activities to include microfinance, skills development, climate resilience, and women's empowerment, establishing themselves as vital community players. Educational institutions, once on the periphery, emerged as important symbols of aspiration, although they did not guarantee employment, a phenomenon similar to the "graduation paradox" observed in North India and Nepal [14]. Simultaneously, government-led initiatives, such as the Kishor-Kishore Clubs[6] and the Activation of Village Courts, organized by the Ministry of Women and Children's Affairs and the Ministry of Local Government, Rural Development, and Cooperatives, also played a role in reshaping the institutional landscape. Although project-based, these initiatives helped build confidence, awareness, and empowerment, while promoting moral values among youth and offering alternative dispute resolution mechanisms. Specifically, the village courts' operation reduced the debt burdens linked to lengthy legal cases in higher courts, thereby decreasing social fragmentation and strengthening family and community bonds.

New institutional forms—such as women's savings groups, youth collectives, and digital platforms—expanded the local landscape by providing spaces for information sharing, services, and mutual support. While religious leaders still held moral authority, their influence in decision-making now coexisted with secular actors, who increasingly included women and youth leaders. Overall, these changes suggest a shift from authority centered in elite, kinship-based structures to a diverse environment where formal and informal institutions interact, sometimes competing but also working together [4].

4.3.2. Trust, influence, and participation

In 1999, people's trust in institutions in the haor region was based on familiarity and closeness—a common pattern in rural South Asia [21]. Families, religious leaders, and, to a lesser degree, village elders were considered reliable, whereas formal institutions like the Union Council and Police Stations were seen as distant, politicized, and unresponsive. As depicted in Case Study 3, influence over institutional decisions was limited; the poor and women, especially, had little power to influence outcomes, with decision-making mainly controlled by landowners and political elites.

By 2025, trust had shifted somewhat, with NGOs and community groups becoming the most trusted sources, especially for women. Women appreciated their involvement in credit, training, and providing a platform for collective expression, echoing similar findings from Sri Lanka, India, and rural Bangladesh, which suggest that NGO membership enhances both material security and collective identity [31]. Some households reported gaining more influence in local decisions, particularly when participating through NGO committees or savings groups. Nonetheless, as seen in Kerala and Nepal, these gains mainly benefited younger women and those affiliated with NGOs, while widows, divorced women, and other vulnerable groups remained excluded [36]. Overall, although new opportunities for influence appeared, patronage politics still played a role in access to benefits and voice, reflecting broader critiques

of "participatory" institutions in South Asia where inclusive narratives often conceal ongoing inequalities [38].

Gender participation experienced a significant change. In 1999, institutional spaces were mostly dominated by men, with women participating passively. By 2025, women's groups, leadership training, and savings collectives helped increase women's visibility, public speaking, and decision-making roles. However, mobility restrictions and gender norms still limited participation in male-dominated institutions like mosques, Union Councils and Police Stations.

Case study 3: Institutional breakdown and the politics of vulnerability

Rani's (pseudonym) life in Fadlipur illustrates how vulnerability deepens when trust in institutions erodes. After her husband's death nearly two decades ago, she depended on her two sons for support. Stability collapsed when her elder son was killed by a powerful local group over an unpaid loan of BDT 10,000 (approximately USD 80). Although she filed a case with the police, the trial has never begun. The accused—widely known in the village—continues to threaten and bribe her to withdraw the complaint. Years of delay and intimidation have left her disillusioned with the justice system. Fearful of retaliation, her daughter-in-law and grandchildren left the village. Her younger son now lives separately and she remains alone in a deteriorating flood-prone dwelling. Surviving on about BDT 600 (approximately USD 5) per week from bamboo crafts, she refuses to borrow from NGOs, believing debt invites danger. For Usha Rani, institutions promise protection and empowerment—but deliver uncertainty, exclusion, and fear.

4.3.3. Corruption, elite capture, and ecological degradation

Elite capture in the haor region has led to significant ecological and social issues, worsening corruption, marginalization, and environmental degradation. By 1999, governance was dominated by transactional politics: Union Councils leaders and party representatives participated during elections but were inaccessible afterwards, often insisting on informal payments for essential services. Religious minorities faced systematic exclusion from relief efforts and resource access, exemplifying widespread marginalization of minorities in rural Bangladesh [39].

By 2025, elite patronage had become more deeply rooted and caused greater environmental harm. In Khaliajuri, unsustainable fishing methods—like China-Duari nets, broodstock harvesting, and dewatering the haor sections—were used to boost short-term profits. Meanwhile, in Gowainghat, illegal stone extraction and unregulated sand dredging from rivers destabilized banks, damaged ecosystems, and increased the risks of floods and erosion. Additionally, the loss of Chaila grass[7], which was once vital for traditional embankment construction, further weakened community resilience [40]. These practices reflect broader regional issues of resource over-exploitation, such as sand mining in India [41], overfishing across South Asia [42], and forest destruction in Nepal [40].

Corruption further deepened inequalities: Elites' dominance over safety nets and services increased reliance on patronage systems. Women lacking male intermediaries faced higher risks of exclusion and harassment, reflecting similar gendered corruption patterns across South Asia [43]. These dynamics illustrate how elite capture turns ecological commons into private gains, shifting social and environmental burdens onto

marginalized groups and undermining long-term resilience against climate change.

4.3.4. Crisis response and resilience building

In 1999, crisis response mechanisms were mostly reactive, informal, and heavily influenced by elite networks. Village elders and Salish committees managed relief efforts during floods, but their decisions tended to benefit wealthier households. Similar patterns have been observed in cyclone-prone coastal Bangladesh and other South Asian countries, where informal networks serve as vital safety nets but often exacerbate inequality [44]. Religious institutions offered shelter and moral support, though material aid was scarce. Despite the Union Council's official role in relief, it was viewed as corrupt and politically biased. NGOs had a limited part, primarily through short-term food-for-work schemes, while kinship networks remained the most dependable safety net, even if their capacity was strained during widespread shocks.

By 2025, crisis management had shifted toward a more multi-actor, resilience-focused approach. NGOs became key providers of emergency aid, leveraging increased digital tools to deliver cash transfers, temporary shelters, water and sanitation services, and psychosocial support. They also invested in flood-resistant infrastructure, climate-adapted crops, and community-led disaster risk reduction efforts. This change reflects a broader trend in which NGOs play a central role in disaster governance throughout South Asia [45]. While local governments adopted digital safety nets and early warning systems, access often remained mediated by patronage, as observed during Nepal's earthquake relief efforts and Sri Lanka's tsunami response [38]. Community organizations, women's savings groups, and youth groups acted as initial responders by distributing food and supervising vulnerable households- mirroring local disaster response efforts across much of South Asia.

Although advances have been made in speed, scope, and professionalism, structural inequalities persist. Political influence continues to impact how beneficiaries are selected, and while women's leadership in crisis response has become more prominent, it remains limited by safety concerns and social norms. Shifting from relief to resilience and adopting a more proactive, risk-informed planning approach signals progress but also underscores the ongoing importance of institutional accountability, digital inclusion, and gender-sensitive disaster governance.

4.4. Evolution of gender relations

Women's experiences of change vary widely by class, religion, and household migration status. Poor Muslim women have experienced modest gains in mobility and income participation, largely through engagement with NGOs and informal labor. Hindu minority women, by contrast, report heightened insecurity and, in some cases out-migration linked to land pressure and social marginalization. Women in migrant households often enjoy increased consumption stability but face prolonged spousal absence and intensified care burdens. These variations underscore that gender transformation is not uniform but stratified.

To contextualize the analysis of gender dynamics, **Table 6** offers a comparative overview of changes in gender relations in the haor region from 1999 to 2025. It highlights key aspects of household and community life, decision-making, vulnerabilities, and generational shifts, showing how deeply rooted patriarchal norms

have slowly shifted towards new, albeit uneven, forms of participation and empowerment. The table briefly summarizes the broader discussion, reflecting both ongoing patterns and new complexities in women's roles, agency, and vulnerabilities.

Table 6. Evolution of gender relations in the haor region, 1999–2025.

Theme	1999	2025	Key Shifts
Structural context & norms	Rigid gender division of labor; men as sole breadwinners, women in unpaid domestic work; female-headed households stigmatized.	Partial blurring of roles; women increasingly engaged in income generation (agriculture, poultry, vegetables, microenterprises) while retaining domestic responsibilities.	Greater economic participation by women, but domestic burden unchanged.
Public & community roles	Public life male-dominated; women absent from meetings, Salish, and leadership roles; mobility restricted.	Women participate in NGO groups, savings collectives, awareness campaigns; limited public speaking; leadership in sociopolitical/religious spaces remains male-dominated.	Expanded visibility, but participation still gender-segregated and conditional.
Decision-making & power	Household decisions controlled by men; women's input symbolic except for elderly widows.	Women in economic/NGO roles have greater say in budgeting, children's education, healthcare; joint decision-making more common among younger/educated couples.	Incremental gains in influence, but male dominance persists over major decisions.
Gender-based violence & vulnerabilities	Violence widespread, normalized, unreported; dowry demands common; birth of girls undervalued; divorced women ostracized.	Awareness of rights improved; some decline in dowry-related violence; covert dowry persists; attitudes toward daughters improve in some households; divorce more navigable for economically independent women.	Partial progress on violence and dowry; vulnerabilities now stratified by class, education, and NGO access.
Stratification & generational change	Norms uniform across classes; all women subject to modesty and domesticity expectations.	Class-based and generational divergence; better-off/NGO-linked women enjoy more autonomy; young educated women aspire to professional roles but face conservative backlash.	Increasingly stratified gender order; generational aspirations challenge traditional norms.

4.4.1. Structural context and normative frameworks

Gender relations in the haor region have traditionally been influenced by deep-rooted patriarchal systems, religious customs, and environmental challenges. This mirrors common patterns in rural South Asia, where women's work is often undervalued and limited to household roles [16].

In 1999, gender roles were distinctly outlined: men primarily earned income through activities like agriculture, fishing, and wage work, whereas women's roles focused on unpaid domestic tasks such as raising children, preparing food, collecting water, and managing the household. These roles reinforced women's economic reliance and their limited visibility in public affairs. Female-headed households, often resulting from widowhood or abandonment, engaged in low-paid and socially marginalized economic activities such as day labor, collecting firewood, and small trading—were low-paid and socially marginalized. This gendered division of labor reflected broader trends seen in rural Bangladesh and India, where women's economic efforts were vital but largely unnoticed [46].

By 2025, incremental changes had taken place due to NGO efforts, migration, and market integration. Women increasingly participated in poultry farming, vegetable cultivation, microenterprise, and petty trading—trends mirrored in other regions of Bangladesh where microfinance and NGO initiatives supported modest economic

participation [31]. However, this growth did not lessen women's reproductive duties, leading to a "double burden," a well-documented issue in South Asia [47].

4.4.2. Gender roles in public and community life

In 1999, public life in haor villages was almost entirely male-dominated, aligning with patterns observed in rural India and Pakistan, where women's mobility was limited by purdah norms and concerns about social stigma [48]. Women's participation in Salish was often mediated through male relatives and subject to moral judgment. By 2025, new opportunities had emerged through NGO-led groups, savings collectives, and awareness campaigns, enabling some women to participate in public forums and decision-making processes. These developments mirror findings from Kerala and Nepal, were collective action increased women's voices even in conservative contexts [49]. Nonetheless, participation remains uneven: women from elite and NGO-connected groups gained visibility, while poorer and minority women continued to be excluded, reflecting broader criticisms of NGO-based empowerment efforts [50].

4.4.3. Decision-making, power, and gender-based violence

Household decision-making in 1999 was overwhelmingly male-controlled, as in much of rural South Asia, where men determined income use, property dealings, marriage, and migration [51]. Women's involvement was mostly symbolic, except when widows or older women exercised authority due to seniority. By 2025, women in income or savings groups reported increased participation in budgeting, healthcare, and children's education, indicating gradual shifts in household power dynamics [52]. Joint decision-making was more common in younger, educated households, though men still held dominance over major or strategic decisions, consistent with evolving generational roles observed in rural Nepal and Sri Lanka [49].

In 1999, gender-based violence was widespread and socially accepted, including physical abuse, verbal humiliation, abandonment, and neglect, with limited access to justice. By 2025, increased awareness of women's rights and reporting channels had developed, partly due to NGO efforts, yet enforcement remained weak. Although dowry-related violence decreased in some areas, economic and psychological abuse continued, reflecting broader South Asian patterns [53].

4.4.4. Persistent and emerging vulnerabilities

In 1999, dowry was a key factor contributing to women's marital insecurity, with failure to meet demand causing delayed marriages, social stigma, and abuse; similar issues were observed in rural Bihar, West Bengal, and Bangladesh [54]. The birth of daughters often increased economic anxiety, reinforcing a preference for sons and leading to discriminatory distribution of resources like food, education, and healthcare. Divorced or abandoned women faced severe economic hardship and social exclusion.

By 2025, overt dowry requests declined in some areas due to awareness campaigns and changing attitudes among educated or migrant households, though covert transactions continued, often disguised as "gifts." Attitudes towards daughters and daughters-in-law have shown slight improvement in households that have benefited from migration and education, consistent with evidence from South Asia

indicating that remittance economies influence gender norms by alleviating material concerns [55]. Nonetheless, son preference and resource discrimination persisted in poorer households, aligning with findings across Bangladesh and northern India [56]. While divorced or abandoned women faced stigma, those with support from NGOs or government safety nets exhibited greater resilience, highlighting the importance of economic independence in reducing vulnerability [52].

4.4.5. Stratification and generational change

In 1999, gender norms in the haor were largely consistent across social classes, emphasizing women's modesty and subordination regardless of wealth. By 2025, gender dynamics had become more stratified, where wealthier or migrant households provided women with greater mobility and decision-making authority, whereas poorer women continued in survival roles. A clear generational change was observed: younger, educated women sought autonomy, employment, and public engagement, often challenging conservative social and family norms and moral policing. This pattern is similar to findings from rural Uttar Pradesh, Nepal, and Bangladesh, where young women juggle increasing aspirations with ongoing patriarchal restrictions [57]. The uneven pace of these changes underscores that, although structural inequalities remain, incremental and contested shifts in gender relations are happening in the haor region.

Widows, divorced, and separated women continue to be among the most vulnerable groups structurally. Despite expanded safety nets, access often relies on political mediation or social approval.

Young men's paths are increasingly influenced by shifting gender norms. Factors like migration, digital connectivity, urban lifestyle exposure, and participation in informal economies—such as gambling and substance use—are transforming notions of masculinity. Although remittance income can bolster household resilience, unsuccessful migration attempts or debt-driven pursuits may lead to heightened stress, domestic conflicts, and social disintegration. Therefore, gender change encompasses not only the expanding roles of women but also the evolving—and at times unstable—masculine identities.

5. Conclusions: From material survival to multidimensional resilience

This longitudinal comparison of participatory poverty assessments in Nuralipur and Fadlipur demonstrates that rural transformation in Bangladesh's haor region cannot be understood through linear narratives of poverty reduction alone. Between 1999 and 2025, material deprivation declined significantly, educational attainment expanded, infrastructure improved, and livelihood diversification intensified. Yet these gains unfolded within an evolving structure of inequality, institutional mediation, and ecological risk. The trajectory observed is not one of simple escape from poverty, but of reconfigured vulnerability.

The 1999 assessment reflected a landscape dominated by material survival concerns: food insecurity, seasonal unemployment, indebtedness, and extreme exposure to climatic shocks. By 2025, many households had moved beyond

subsistence-level insecurity. Migration—both internal and international—emerged as a decisive driver of income growth and asset accumulation. NGO engagement, microfinance, social protection programs, and state-led infrastructure investments reshaped opportunity structures. Education, particularly for girls, expanded aspirations and diversified livelihood pathways. These shifts represent meaningful structural change.

However, the findings equally reveal the consolidation of wealth and authority among a small rural elite. Control over land, fisheries, political patronage networks, and access to state resources has increasingly concentrated. Elite capture within local governance institutions has mediated who benefits from development interventions and who remains exposed to risk. Vulnerability has therefore not disappeared; rather, it has become stratified. While extreme poverty has receded, inequality has widened, and adaptive capacity is unevenly distributed.

The haor case underscores the importance of conceptualizing vulnerability as dynamic and relational. Exposure to environmental hazards remains structurally embedded in the wetland ecology. Yet sensitivity and adaptive capacity are shaped less by geography alone than by asset ownership, migration networks, institutional access, gender norms, and political positioning. Households have repositioned themselves within a shifting matrix of risk and opportunity. Some have leveraged migration and institutional linkages to build buffers against climatic shocks. Others remain dependent on precarious labor markets, informal credit, and unstable access to common resources.

Gender and generational transformations further illustrate the multidimensional character of resilience. Women's education and participation in economic activities have expanded, but unevenly across class and religious divides. Younger cohorts articulate new aspirations shaped by migration, digital connectivity, and exposure to external labor markets. These changes signal social transformation beyond material income growth, yet structural constraints—including patriarchal norms and unequal asset distribution—continue to mediate outcomes [58].

Taken together, the evidence suggests a transition from a context primarily defined by material survival toward one characterized by multidimensional resilience. This resilience encompasses improved assets, diversified livelihoods, institutional engagement, and expanded capabilities. Yet it remains conditional and fragile. Climatic volatility, market instability, health crises, and governance failures can rapidly erode gains, particularly among households without access to migration capital or political patronage.

The broader implication is that sustainable poverty reduction in climate-vulnerable regions requires more than income growth or infrastructure expansion. It demands governance systems that are inclusive, accountable, and attentive to structural inequalities in land, resource access, and institutional power. Adaptation strategies must therefore integrate climate resilience with social justice considerations, ensuring that protective measures do not inadvertently reinforce elite control or deepen stratification.

The haor experience contributes to wider debates on rural transformation in South Asia and other climate-exposed regions [59]. It demonstrates that progress and precarity can coexist; that vulnerability can be reorganized rather than eliminated; and

that resilience must be understood as socially differentiated. Longitudinal participatory approaches, by revisiting communities over extended periods, are uniquely positioned to reveal these layered dynamics.

Ultimately, the transition from material survival to multidimensional resilience is neither uniform nor complete. It represents an ongoing negotiation between ecology, economy, and power. Recognizing this complexity is essential for designing development and adaptation policies that are both climate-responsive and structurally inclusive.

6. Policy implications

Policy directions must therefore move beyond narrow poverty alleviation and toward inclusive, equitable development tailored to the haor's ecological and social distinctiveness.

First, resource governance reforms are vital, especially in preventing the illegal occupation of commons. Transparent leasing of jalmohals[8] and regulating sand and stone collection can help reduce elite capture and promote fairer access for poorer households, aligning with calls for accountable natural resource management in South Asia's wetlands and commons [36]. Additionally, strengthening local government institutions, such as the Union Council, through increased downward accountability, social audits, and transparent procedures for social safety net inclusion, as well as issuing documents like birth and death certificates, is essential for resilient haor governance.

Second, migration governance should be priorities. As remittances play a crucial role in upward mobility, it is essential to have stronger protections against fraud, debt, and exploitation, as well as reintegration support for returnees. Regional evidence indicates that implementing safe migration frameworks can enhance developmental benefits while reducing associated risks [60].

Third, gender-responsive strategies should target both socioeconomic empowerment and structural obstacles. Improving women's access to assets, skills, and leadership positions must go hand in hand with efforts to share care responsibilities, prevent gender-based violence, and challenge discriminatory norms. As seen in South Asian experiences, addressing patriarchy is crucial for maximizing the benefits of microfinance and livelihood programs [59].

Fourth, social protection systems need to be expanded and digitized to minimize leakages and political bias, while ensuring coverage for minorities, widows, and the chronically poor. Data from Bangladesh and India show that inclusive safety nets enhance resilience and reduce distress migration during crises [61].

Fifth, integrating anticipatory action into humanitarian aid and social safety programs can allocate resources before floods and cyclones, decreasing damage and reducing dependency on relief efforts. Specifically, connecting forecast-based financing with initiatives like the government's Gratuitous Relief and Vulnerable Group Feeding programs provides a scalable way to safeguard vulnerable households, build resilience, and implement early warning–early action commitments under the Sendai Framework 2015–2030 [62] and Bangladesh's Standing Orders on Disaster 2019 [63].

Sixth, climate adaptation and infrastructure investments tailored to haor ecologies—like flood-resistant housing, climate-smart crops, safe water systems, and eco-friendly infrastructure—are vital to mitigate displacement and livelihood loss. Bangladesh's major frameworks, including the Eighth Five-Year Plan, Perspective Plan 2041, and Bangladesh Delta Plan 2100, prioritize resilient housing, embankments, climate-smart agriculture, and wetland management in the haor belt [64,65]. Effective implementation must focus on equitable distribution, especially for marginalized groups such as women, minorities, and landless households. Interventions require understanding local ecologies and vulnerabilities. For example, villagers once relied on Chaila grass to construct seasonal embankments that protected settlements from monsoon erosion. With the expansion of mechanized agriculture, this grass has become scarce, reducing communities' ability to self-protect despite improvements in food security. Addressing arsenic contamination in drinking water is also critical for health and resilience. Thus, adaptation strategies should go beyond infrastructure, integrating ecosystem protection, livelihood diversification, and ensuring agricultural practices do not increase vulnerability.

Finally, tackling emerging social issues like drug abuse, trafficking, and gambling requires a coordinated effort across sectors, combining law enforcement with youth participation, job creation, and mental health support. Protecting religious minorities is also crucial, as they often face exclusion and insecurity in the haor region. This involves stricter enforcement of anti-discrimination laws, community peacebuilding projects, and including minority households in social safety programs and climate resilience efforts. Without these comprehensive strategies, the social fabric of haor communities may continue to weaken despite economic gains.

In conclusion, the transformation of Nuralipur and Fadlipur encapsulates both the promise and pitfalls of rural change in South Asia. The challenge for policymakers lies in consolidating poverty reduction while addressing the entrenched inequalities and emergent vulnerabilities that continue to shape life in the haor.

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Notes

1 State engagement in haor areas has shifted from reactive, relief-focused interventions in the 1990s to more coordinated, multi-sectoral strategies by the 2010s. Early interventions were limited to post-flood relief, embankment repair, and basic rural infrastructure, implemented through line ministries. The early 2000s Poverty Reduction Strategy Papers (PRSPs) acknowledged the region's structural disadvantages, introducing targeted seasonal employment schemes. The 2012 Master Plan for Haor Area Development marked a significant policy milestone by integrating infrastructure, agriculture, disaster risk reduction, education, and health within a coordinated framework. Subsequent strategies—Vision 2021, the Eighth Five-Year Plan (2021–2025), and the Delta Plan 2100—reinforced commitments to adaptive infrastructure, ecosystem management, and livelihood diversification. Since 2020, new initiatives such as the National Adaptation Plan (2023–2050), Vision 2041, anticipatory action pilots, and post-COVID-19 safety nets have expanded resilience pathways. Mechanized agriculture and the construction of elevated and submersible roads have further strengthened food security and connectivity, even as intensifying hazards, including more frequent thunderstorms, continue to expose the haor to emerging vulnerabilities. Parallel to these state efforts, NGOs evolved from delivering short-term relief in the 1990s to sustained, multidimensional community engagement. Expanding into microfinance, they enhanced access to credit—particularly for women—while promoting skills development, literacy, and leadership. Women's economic participation and household decision-making power increased through savings groups, livestock rearing, and homestead-based enterprises. By the 2020s, NGOs also played a key role in climate adaptation, social mobilization, and facilitating *access to social protection, complementing state-led initiatives.*

2 Nuralipur village reflects the infrastructural isolation typical of the haor. Established in 1978 as a resettlement site for landless families after the Bangladesh Inland Water Transport Authority acquired land for dredging, it has since been reshaped by recurrent flooding and river erosion, resulting in a narrow, linear settlement surrounded by floodplains. The village, once religiously mixed, is now entirely Muslim, with most households lacking formal land ownership. Education remains limited:

although a government primary school and a madrasa now exist, the school is submerged for half the year, leading to frequent dropouts. Access to higher education and healthcare in the Netrokona district town requires costly, multi-stage travel, affordable only to wealthier families. Livelihoods are dominated by day labor, fishing, and sharecropping, supplemented more recently by motorbike and auto-rickshaw services by youth.

3 Fadlipur village exhibits a distinct trajectory, influenced by its proximity to stone-rich hills, cross-border trade, and the Ratargul freshwater swamp forest. Historically Hindu-majority, it is now predominantly Muslim, though socially conservative norms persist. In 1999, only one distant primary school served the village, but by 2025, two additional government primary schools and a non-government high school had been established, alongside a longstanding madrasa. However, Hindu residents continue to lack access to religious educational institutions. Unlike Nuralipur, Fadlipur is well-connected to other sub-districts and Sylhet town by affordable public transport, enabling access to higher education, healthcare, and market opportunities. Livelihoods continue to rely on farming, day labor, fishing, and small trade, supplemented by migration and engagement in sand and stone-related activities.

4 Salish (or Shalish) is a traditional, informal community-based dispute resolution mechanism. It typically involves respected village elders mediating conflicts to provide accessible, low-cost justice outside the formal court system.

5 A Union Council, formally known as a Union Parishad, is the smallest rural administrative and local government unit in Bangladesh. It serves as the grassroots tier of local governance, responsible for community development, essential public services, and maintaining local law and order.

6 The Kishor-Kishore Clubs (Adolescent Clubs) initiative is a government-led program designed to provide a safe space for teenagers (aged 10–19) to learn, socialize, and develop life skills, with a primary focus on preventing child marriage and reducing gender-based violence.

7 Chailla grass (scientifically known as *Hemarthria protensa*) is a crucial, native, and rot-resistant aquatic grass found in the haor areas.

8 Jalmohals (or Jolmohals) are government-owned inland water bodies—such as haors, baors, beels, rivers, canals, and lakes—that are registered and leased out for fishing purposes. They are considered public property and represent a crucial, yet contentious, aspect of wetland management in Bangladesh.

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