Socioeconomic and Livelihood Impact of Flood by Major River of Jhenaidah District, Bangladesh

Dr. Raman Kumar Biswas Professor[1], Al Shanta Islam[2], Gita Mistry Senior Officer[3], Hritika Das[4], Ahammod Hassan Naim[5], Sadia Sarna[6], Fatema Tujjohora Orpa[7]

[1]Department of Disaster Resilience and Engineering Faculty of Environmental Science and Disaster Management Patuakhali Science and Technology University Dumki, Patuakhali-8602

[2]Master student Department of Disaster Resilience and Engineering Faculty of Environmental Science and Disaster Management Patuakhali Science and Technology University Dumki, Patuakhali-8602

[3]IWRM & Private Sector Integration GO4IMPact Programme Eco-Social Development Organization (ESDO)

[4567]Faculty of Environmental Science and Disaster Management Patuakhali Science and Technology University

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ABSTRACT

Floods are among the most frequent and devastating natural disasters worldwide, significantly disrupting livelihoods, economies, and ecosystems. The socio-economic consequences are severe, especially for rural populations dependent on agriculture in Bangladesh. This study investigates the socio-economic impacts of flooding along the banks of the Gorai River in Jhenaidah District, Bangladesh, with emphasis on post-flood management, community resilience, and recovery mechanisms. Using a mixed-method approach, primary data were collected through household surveys, key informant interviews, and focus group discussions. Results reveal that floods disproportionately affect agricultural productivity, livestock rearing, small businesses, and access to education and healthcare, with crop loss and financial damages being the most pronounced. Financial damages were considerable, with 48% of households reporting losses exceeding 50,000 BDT. The findings also highlight that flood preparedness measures are inadequate, early warning systems are weak, and recovery efforts are heavily reliant on government (52%) and NGO (33%) assistance, with limited community-driven initiatives. To minimize the river erosion, dual approach of river management need to implement focusing on both the physical infrastructure like use of Geo-bag, use of locally bamboo made Parko file, and community-led governance can reduce the river erosion. Permanent protection requires immediate action to halt illegal sand extraction, timely construction of robust embankments, geo-bags before the monsoon, and continuous river dredging to increase and maintain navigability. For the long term approach need to be aware of the local community for afforestation and construction authorities needs to be accountable and transparence for any construction work along the bank of the Gorai river. Despite significant short-term relief efforts, gaps remain in long-term resilience strategies, particularly in financial recovery, infrastructure rebuilding, and livelihood diversification. The study recommends strengthening localized flood preparedness, early warning systems, and community-based adaptation in enhancing resilience in the flood-prone regions of Jhenaidah district, Bangladesh.

Keywords: Floods, Socio-economic impacts, Livelihood, Post-flood recovery, Shailakupa, Gorai

INTRODUCTION

Flooding is one of the most destructive and common natural disasters in the world. Between 2000 and 2019 it caused economic losses of more than US$650 billion and impacted around 1.5 billion people (UNDRR, 2020).

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Throughout South Asia floods are a persistent problem, particularly in Bangladesh. This is caused by the nation's low-lying terrain, monsoon climate, and location in the Ganges-Brahmaputra-Meghna River basin (Mirza, 2011; Brammer, 2014). In Bangladesh, seasonal floods can offer both benefits and drawbacks. They contribute to restoring soil fertility, but they also cause a large loss of infrastructure, crops, property, and human life (Gain et al., 2015).

The Gorai River, a Ganges distributary, is the lifeline of agriculture, fisheries and the economy in the southwestern part of Bangladesh. But its fringe floodplains are highly susceptible to seasonal flooding, especially in Jhenaidah District, where repeated floods affect socio-economic equilibrium. It has been documented that rural households in Bangladesh experience crop failure, livestock mortality, decline in income and food insecurity during and after flooding (Paul & Routray, 2010; Habiba et al., 2012). Vulnerable population categories such as women, children and the old are widely affected without enough resources of recovery for them (Rashid & Michaelsen, 2015).

While both government and nongovernmental actors conduct relief and rehabilitation activities, there are still gaps in the development or establishment of long-term resilience. Lack of effective flood early warning, failure in livelihood diversification and infrastructure reconstruction perpetuate the recovery challenges (Islam & Sado, 2000; Alam & Collins, 2010). There is also a gap in localized research on both the immediate aftermath following flooding as well long-term recovery and resilience factors in smaller riverine villages such as those bordering on the Gorai River.

This study therefore aims to:

1. Evaluate the socio-economic impact of floods surrounding the bank of the Gorai River in Jhenaidah.

2. Explore the previous-flood management, recovery practice and knowledge gaps.

3. Propose recommendations for increasing community resilience to recurrent flooding.

The study contributes to the flourishing part of literature on disaster risk reduction in Bangladesh by combining quantitative and qualitative data, while offering the localized intuition which can guide in designing more effective adaptation and recovery strategies to the policymakers, NGOs and disaster managers.

LITERATURE REVIEW

Floods and Global Socio-Economic Impacts

Floods is the most globally widespread natural hazard which is contributing 43% of all recorded natural disasters between 1995 and 2019 (CRED & UNDRR, 2020). They effect in severe human, social, and economic losses, disrupting livelihoods, infrastructure, health, and education (Ahern et al., 2005). Flood-related disasters displace millions annually in globally, due to limited capacity the countries experiencing greatest impacts with low and middle-income (Jonkman, 2005; Hallegatte et al., 2016). Floods cause destroys crops and property as well as it enhances poverty cycles by reducing employment opportunities and increasing vulnerability to future disasters. (Winsemius et al., 2015).

Floods in Bangladesh

Being a deltaic region and having to deal with monsoon rains and rivers that flow from the upstream, Bangladesh is among the top ten countries that face floods in the worst way. On a regular basis, one-fifth to one-third of the country gets flooded, and the figures can rise to 60% in the case of very heavy floods (Brammer, 2014; Mirza, 2011). Floods have an impact on food security, the availability of water, hygiene, and health. As the rural populations are more dependent on agriculture and fishing, they are the most vulnerable (Islam & Sado, 2000; Brouwer et al., 2007). The proclaimed economic cost of floods in Bangladesh is almost 2% of the country's annual GDP. It thus shows their recurring role as a stumbling block to national development (World Bank, 2010).

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Livelihood Impacts

Floods have a great impact on the lives of rural people involved in farming and other activities dependent on agriculture in Bangladesh. Lack of proper food and less income ultimately results from damages of crops, deaths of domestic animals, and destruction of the place where one lives create a vicious cycle (Habiba et al., 2012). Almost, every farmer has to pay the price of waterlogging directly or indirectly in the form of debts, decreased agricultural productivity, and soil degradation (Paul & Routray, 2010). Apart from the agriculture-related sectors (small businesses and wage labor) that are affected by floods; there is a further decrease in the local economy because of floods in such areas (Huq et al., 2015). Poor and vulnerable communities, in particular, women and children, are affected more than others, due to decreased freedom of movement, lack of opportunities for education, and exposure to various diseases (Rashid & Michaelsen, 2015).

Post-Flood Recovery and Resilience

The steps to come out of the aftermath of floods in Bangladesh consist of relief activities to be undertaken immediately, rehabilitation in the medium-term, and adaptation at a later stage. local government offices and NGOs provide, relief, which includes food, shelter, and medical aid, yet there are still unfilled spaces when it comes to a recovery plan that goes beyond mere survival (Alam & Collins, 2010; Paul & Hossain, 2013).

The rebuilding of the land (infrastructures, residences, and agriculture) and the socio-economic revival (diversifying sources of income, community-based adaptation, and early warning systems) are the two aspects that determine the success of recovery (Sayers et al., 2013; Gain et al., 2015). But, as recovery is not always done equally, poor households might need a longer time to recover and be exposed to the risk of being vulnerable again (Wisner et al., 2004).

Research Gap and Relevance

Many studies have examined the socio-economic impacts of floods on Bangladesh, but the number of such studies that have deeply investigated the flood effects of small rivers like the Gorai is very limited. Most of the studies that have been done so far are focusing on the impacts of the Brahmaputra, Ganges, and Meghna rivers and at the national level.

However, there is a lack of sufficient information about the experience of the riverine communities of the smaller rivers in the aspects of flood management, recovery after the flood, and building resilience, for example, in the Jhenaidah District. An important step for the proper designing of locally relevant policies and community-based strategies for disaster risk reduction would be to solve this problem.

METHODOLOGY

Research Design

This study was based on a mixed-methods research design, where both the qualitative and quantitative approaches were used to get insights of the socio-economical impacts of flood in the Gorai River–affected areas of Jhenaidah District (Creswell & Plano Clark, 2017). The numerical part quantitatively assessed the magnitude of loss, decline in income and source of livelihoods, as well as recovery condition of households. Concomitantly, the qualitative section examined people's experiences with the flood, perceptions of risks, (means of) coping and adapting strategies, and factors that explain long-term resilience (Patton, 2002; Tashakkori & Teddlie,1998).

Mixed-methods approaches are particularly useful in disaster research - they not only enable findings from multiple types of data to be compared but also thereby strengthen the reliability and validity of results at work being reported (Denzin, 1978; Creswell & Plano Clark, 2017). Integrating numerated data with rich narratives of community experience, the study offers a more comprehensive, evidence-based view of life for those living in flood-stricken areas. Such a clear

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understanding serves as a firm foundation for policy formation and proactive as well as resilient strategy development (Cutter, Boruff & Shirley, 2003)

Study Area

This study takes place along the banks of the Gorai River in southwestern Bangladesh, specifically in the Jhenaidah District—a place where families live with the constant threat of flooding. Here, the seasonal monsoons don't just bring rain; they frequently upend lives by destroying crops, damaging homes, and stalling the small businesses and fishing trades that people rely on to survive.

Unfortunately, recovering from these disasters is incredibly tough due to deep-rooted economic challenges, not to mention the added stress of riverbank erosion and waterlogging. Because these communities face such a complex mix of hardships, they offer a vital window into what it really means to live with flood risks. By listening to their stories and understanding how they cope, this research aims to help create smarter, more compassionate support systems for people on the frontlines of climate hazards.

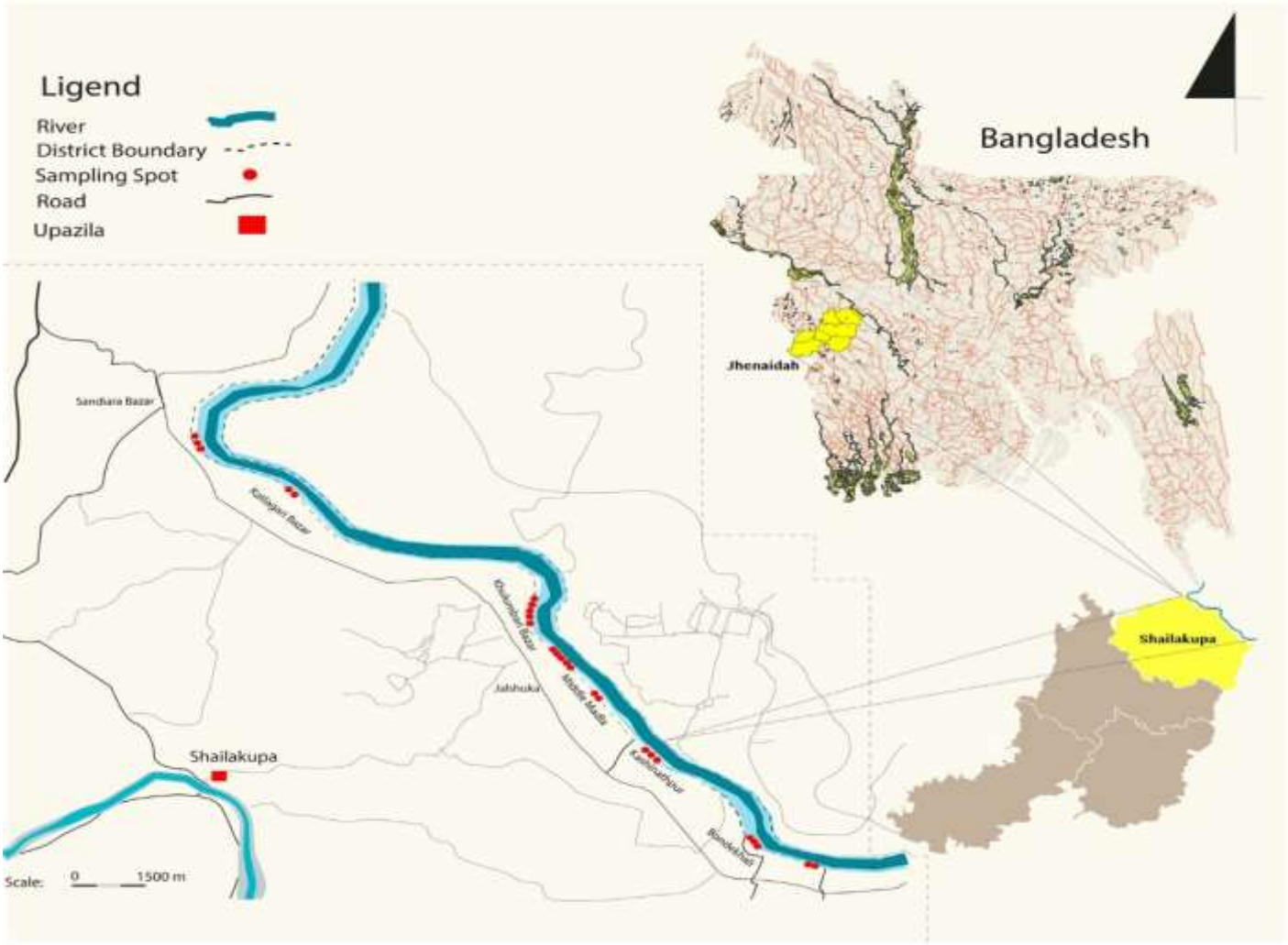

Figure 1: Map of Study Area using QGIS 3.2 and Adobe Illustrator

Sampling and Data Collection

Primary data were gathered using several methods, including household surveys, key informant interviews (KIIs), focus group discussions (FGDs), and direct field observations. Before the main data collection began, an initial field visit was conducted to better understand the context, identify major indicators of flood impacts, and adjust the survey tools accordingly. This early assessment

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ensured that the tools used for data collection were context-appropriate and capable of capturing the most relevant information for the study.

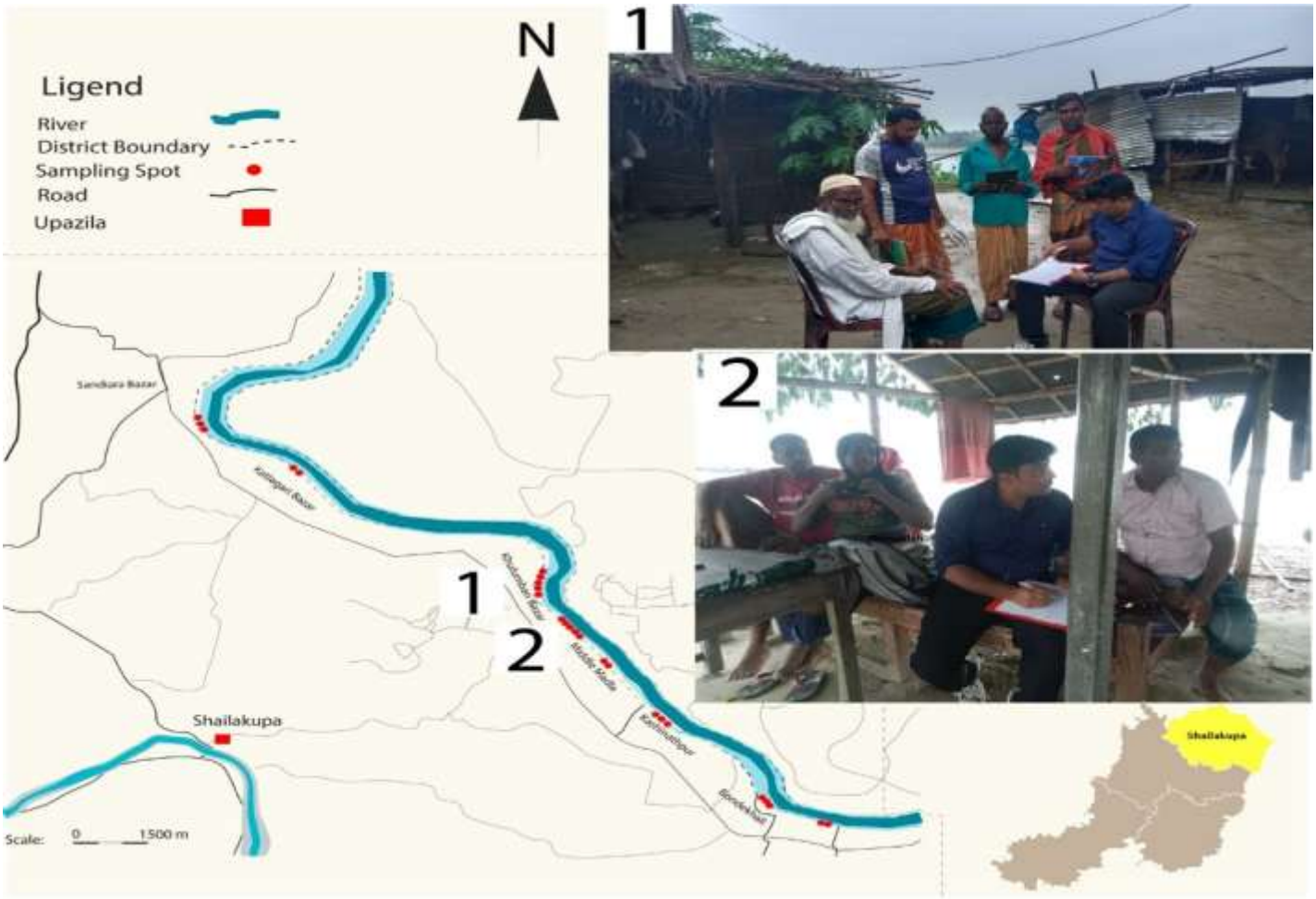

Figure 2: Data collection from different part of the study area (Spot1: Moddho Madla; Spot 2: Khulumbari).

The sample size was determined using Taro Yamane's formula (1967):

$$n = N/(1+Ne^2)$$

Where n = sample size, N = total population, and e = precision level (set at 5%). This ensured statistical representativeness of the surveyed households.

Household surveys were used to collect information on demographic profiles, income levels, educational attainment, land ownership, livelihood activities, and the impacts of recent floods. Key informant interviews with local government officials, NGO representatives, and community leaders provided institutional insights into flood management practices and recovery processes. In addition, focus group discussions were conducted separately with men and women to explore gender-specific vulnerabilities, experiences, and coping strategies in responding to flood events.

Data Analysis

The survey data was entered into Excel and cleaned to ensuring reliability and accuracy. Therefore, descriptive statistics like averages, percentages and standard deviations were used to understand the socio-economic status of the respondents' and how the floods affected them. Interviews and focus group discussions were conducted to collect qualitative data. The transcripts were carefully reviewed, coded, and organized into themes to better understand the community's perspectives on flood experiences,

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recovery, and adaptation strategies. These thematic analyses helped reveal the stories behind people's challenges, resilience, and pathways to rebuilding their lives

Mapping and Visualization

QGIS 3.2 was used to visualize the geospatial data and turn them into clear maps and charts that showed how different parts of the community were affected by flooding. These spatial outputs helped reveal which areas were more exposed and which groups were more vulnerable.

RESULTS AND DISCUSSION

Demographic Characteristics: Gender

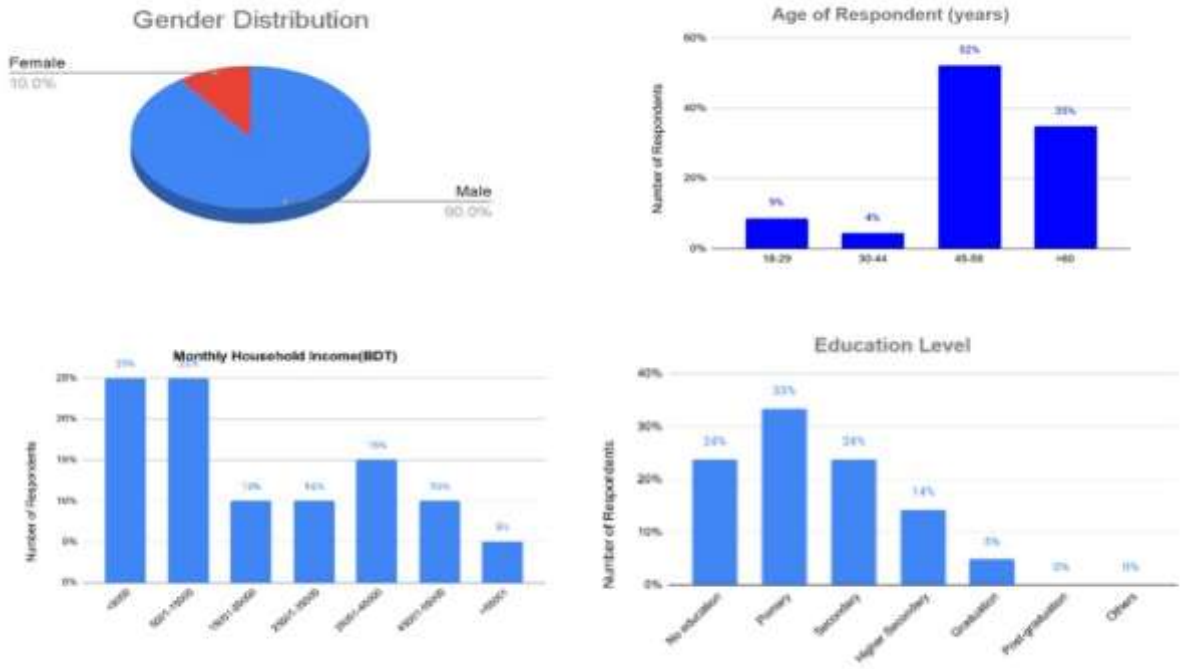

Figure 3: Gender Distribution, Age of the Respondents, Monthly Household Income, and Education Level of the study area.

In demographic profile, we found about 90% predominantly male population, which female only 10%. It indicate the fragile flood-related decisions and livelihood strategies are largely male-dominated, potentially low involvement of women's in resilience planning.

Age

The graph chart "Age distribution" we saw, in our study about 52% respondents were middle-aged and were between 45–59 years, and 35% were above 60 years, while only 9% were aged 18–29. According to data, older population group in flood-prone area, which may mastery both labor capacity and adaptive strategies (Fig. 3)

Household Income

The graph chart "Household income" illustrated, nearly half of the respondents (50%) reported monthly household incomes of ≤15,000 BDT, while only 5% earned above 55,000 BDT. As a result, economic vulnerability, consistent with studies linking low income to reduced disaster coping capacity in rural Bangladesh (Brouwer et al., 2007) (Fig. 3).

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Education

The key significant area is educational attainment, we found only 33% had only primary education, 24% had no formal education, and 24% had completed secondary schooling. However, only 14% had higher education, and a mere 5% had a bachelor's degree, with none reporting postgraduate qualifications. Consequently, educational limitations restrict awareness, preparedness, and access to diverse livelihoods, reinforcing flood vulnerability (Paul & Routray, 2010) (Fig. 3).

Occupation

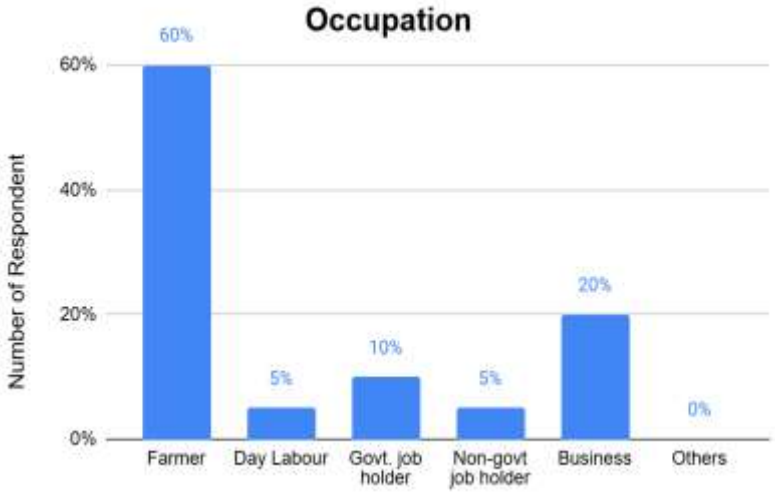

Figure 4: Occupation of the Respondent of the study area.

We found in chart "occupation", notably with 60% of respondents engaged in farming, followed by business (20%). In contrast, Government and non-government job holders accounted for 10% and 5% respectively, while day laborers represented 5%. For this reason, highly dependency on farming reveal the high livelihood sensitivity to floods, as agricultural damage directly translates into income loss.

Land Ownership

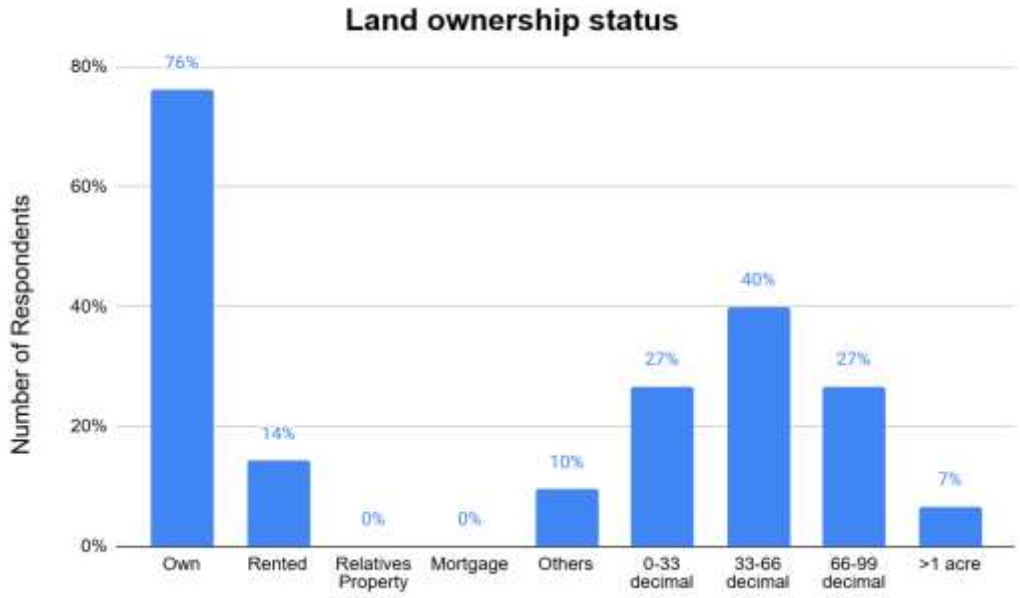

Figure 5: Land Ownership Status of the study area.

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The chart “Land ownership” we found was 76% respondent had own land, but holdings volume were generally small: 27% owned ≤33 decimals, 40% owned 33–66 decimals, and 27% owned 66–99 decimals, while only 7% owned more than one acre. These findings align with national trends of smallholder farming, where limited land restricts resilience and diversification options (Habiba et al., 2012).

Flood Characteristics

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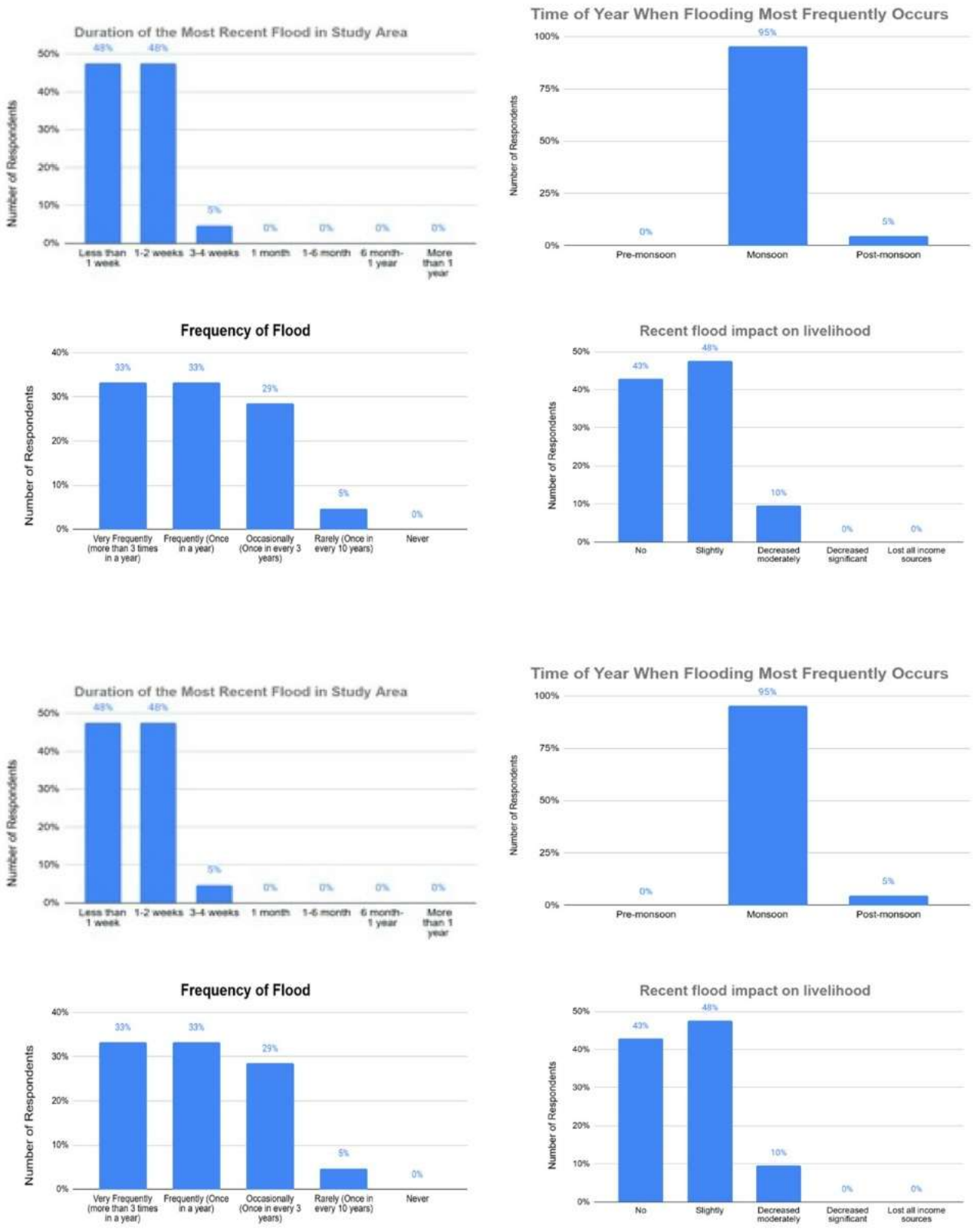

Figure 6: Flood Characteristics, Time of Flood, Frequency of Flood, and Impact of Flood status of the study area.

From the study we found that 48% of respondents experienced floods lasting less than two weeks, while only 5% reported durations of three to four weeks, with no cases of prolonged flooding. This trend indicates that short-duration floods dominate in the Gorai River basin, though even brief events can cause substantial

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livelihood disruptions. Similar findings in Bangladesh highlight that recurrent but short floods still generate significant socio-economic stress (Brouwer et al., 2007).

On the other hand 95% of respondents reported they experiencing floods during the monsoon season, compared to only 5% in the post-monsoon period (Fig. 6). Overall,we founds the strong correlation between monsoon rainfall and flood occurrence in the Gorai River basin. Similar patterns have been observed across Bangladesh, where monsoon-driven riverine flooding is the dominant hazard (Mirza, 2011; Brammer, 2014).

In the chart "flood Frequency" we found one-third of respondents reported experiencing floods "very frequently" (33%) and another third "frequently" (33%), while 29% faced them "occasionally" and only 5% "rarely." None reported never experiencing floods, this tendency confirming that flooding is a recurrent hazard in the study area (Fig. 6).

Finally this result aligns with evidence that rural Bangladeshis experience floods as a regular phenomenon rather than isolated events (Paul & Routray, 2010).

Livelihood Impacts

The recent flood had limited effects on livelihoods: 48% of respondents reported slight impacts, 10% moderate impacts, while 43% experienced no impact, and none reported severe disruption (Fig. 6).. This suggests relative resilience in the community, despite recurrent flooding. Comparable studies in Bangladesh have shown that localized floods often cause moderate rather than catastrophic livelihood losses (Brouwer et al., 2007).

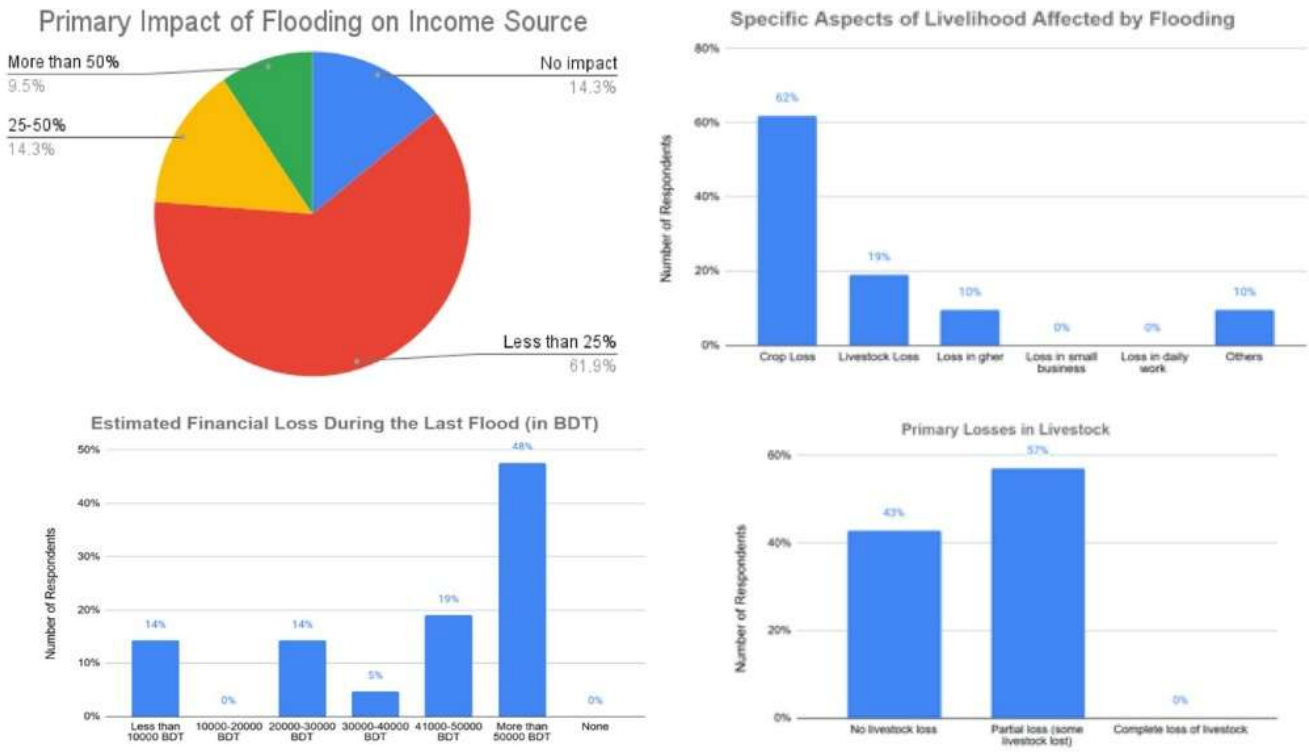

Figure 7: Impact of Flood on Income Source, Impact of Flood on livelihood, Impact of flood on the financial loss, Impact of financial loss in Livestock, of the study area.

The pie chart "Impact of Flood on Income Source" we found flooding reduced household income by less than 25% for 61.9% of respondents, while 14.3% reported no impact, another 14.3% lost 25–50%, and 9.5% suffered reductions over 50%. These were expound that while most households experienced only minor income shocks,

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a notable minority faced severe financial strain. Above-mentioned disparities in income loss due to floods have been documented in rural Bangladesh (Paul & Hossain, 2013).

The chart "Impact of Flood on livelihood" we found in study area's small businesses were less directly affected, with 62% reporting impacted by crop loss, though 19% experienced livestock and others loss and loss in gher both were 10% (Fig. 7).The chart about "Impact of flood on the financial loss" we can saw 48% of households reported flood-related losses exceeding 50,000 BDT, with smaller proportions reporting losses between 20,000–50,000 BDT. These findings were relevant with national evidence showing that agricultural households bear the heaviest economic burden of floods (World Bank, 2010).

On the other hands, about the chart "Financial loss in Livestock" we found Livestock was moderately affected, with 57% of respondents reporting partial losses, while 43% reported no loss, and none experienced complete loss (Fig. 7). This findings suggests that floods disrupted animal assets but did not fully devastate herds. Corresponding findings highlight partial livestock losses as a recurrent outcome of floods in rural Bangladesh (Habiba et al., 2012).

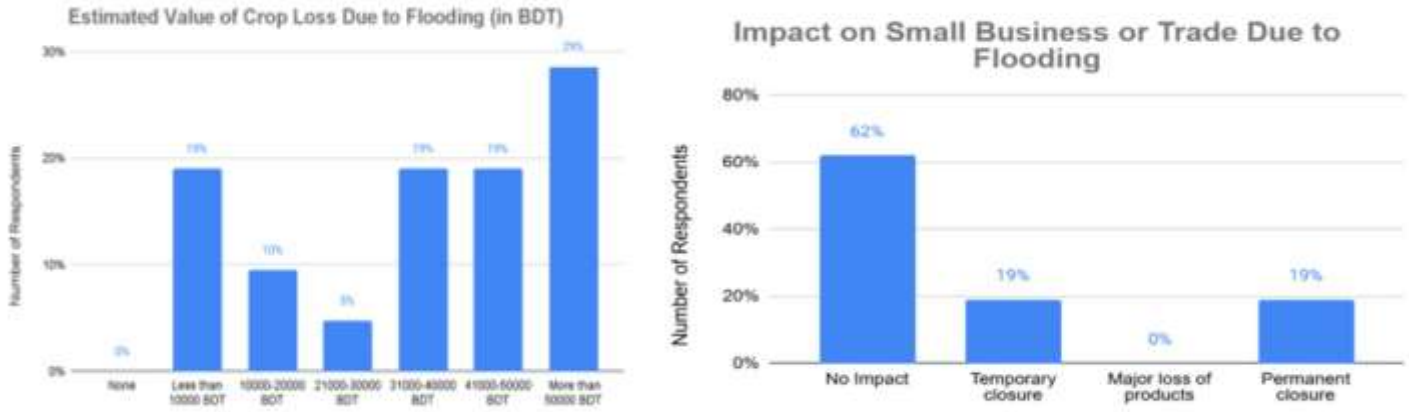

Figure 8: Estimated value of crop loss due to the flooding, Impact of small business of the study area.

The chart "Estimated value of crop loss due to the flooding" saw our findings of respective study in which all respondents reported crop losses was appreciable, about 29% losing more than 50,000 BDT and 19% each losing less than 10,000 BDT, 31,000–40,000 BDT, or 41,000–50,000 BDT. While smaller groups (10%) lost 10,000–20,000 BDT and (5%) 21,000–30,000 BDT respectively. (Fig. 8). From the findings we confirmed that floods cause widespread and often severe agricultural losses, consistent with national evidence of crop vulnerability in Bangladesh (Brammer, 2014). On the other hand , from the chart "Impact of small business of the study area" we found most small businesses were unaffected by flooding (62%), though 19% faced temporary closure and another 19% reported permanent closure, while none experienced major product loss (Fig.8). These trend elicit resilience for many enterprises but severe disruption for a minority. the same studies note that informal businesses in rural Bangladesh are highly exposed to flood-related closures (Alam & Collins, 2010).

Health and Basic Services

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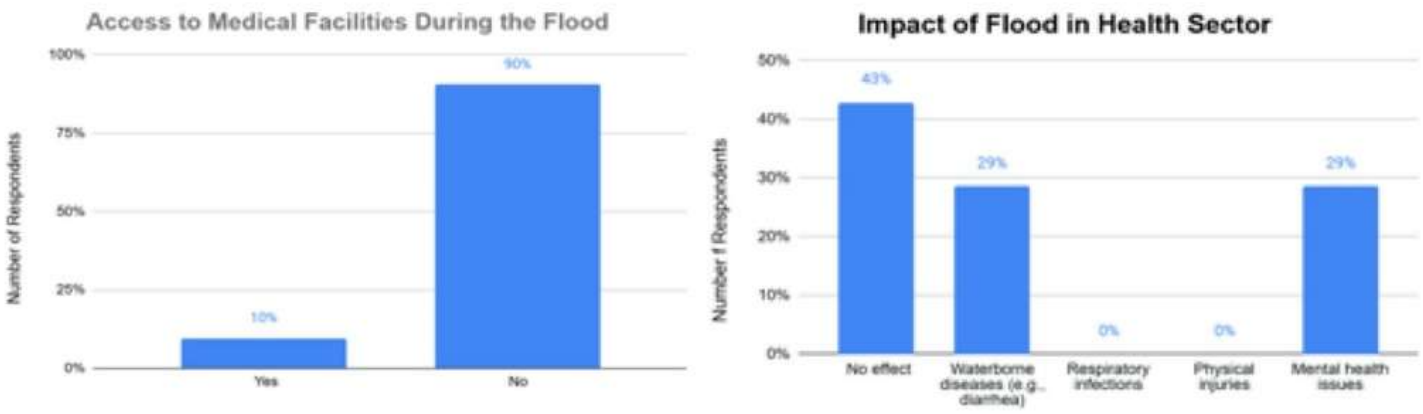

Figure 9: Access to medical facilities during the flood, impact of flood in health sector of the study area.

The chart "Access to medical facilities during the flood" represented our findings where floods severely disrupted access to healthcare services and water. The highest point (90%) reported no access to medical facilities during floods, and 29% experienced waterborne diseases likes diarrhea.

Besides, the same proportion 29% respondents reported mental health challenges, reflecting the psychosocial burden of disasters. On the other hands, no respondents faced respiratory infection and physical injuries which were very positive.

Drinking Water Sources

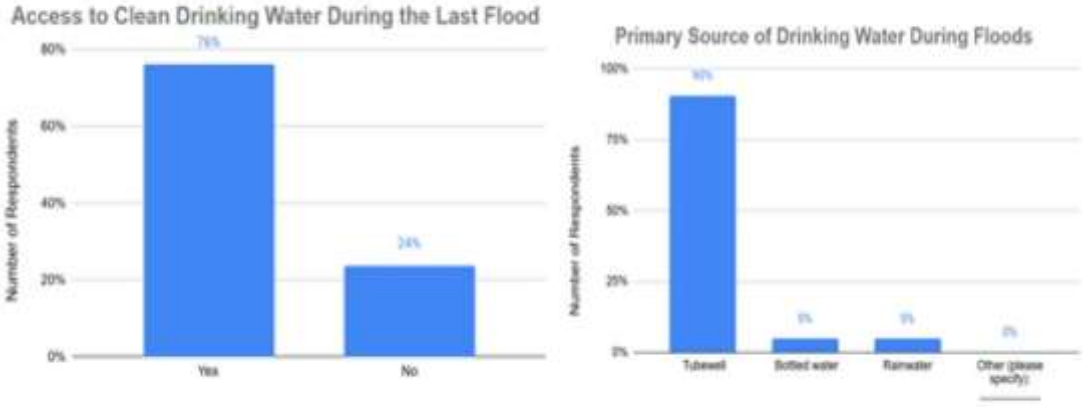

Figure 10: Access to clean water during the flood, Primary source of drinking water of the study area.

The chart "Access to clean water during the flood" we saw during the last flood, 76% of respondents reported access to clean drinking water, while 24% lacked safe sources, exposing them to health risks. This highlights partial resilience in water supply but also a significant vulnerable group. Similar studies in Bangladesh confirm that limited safe water access during floods increases the risk of diarrheal and waterborne diseases (Rashid & Michaelsen, 2015). Besides, we saw in chart "Primary source of drinking water of the study area" in the time floods, 90% of respondents relied on tubewells as their primary drinking water source, while only 5% used bottled or rainwater (Fig. 10). Available access to groundwater highlights both resilience against surface contamination and vulnerability to aquifer pollution during severe floods. The outcome highlight vulnerabilities

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in water, sanitation, and health (WASH) services during floods, echoing broader challenges in Bangladesh (Huq et al., 2015). On contrast, the heavy reliance on tubewells as a dominant but fragile water source has been documented in rural Bangladesh (Huq et al., 2015).

Education and Displacement

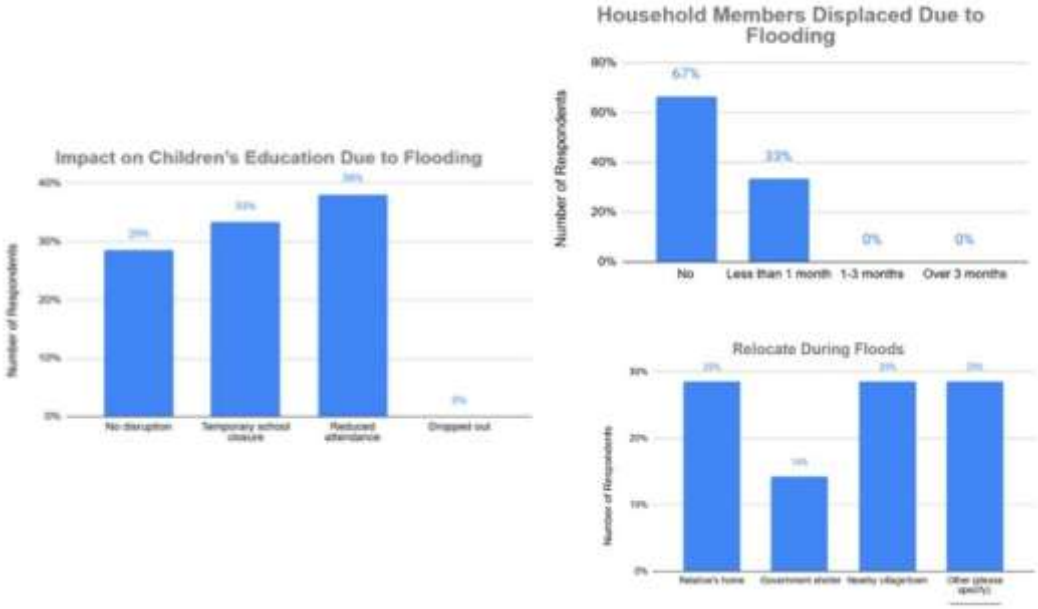

Figure 11: Impacts on children education, Household member displaced due to flooding, Relocation during flood, of the study area.

The chart "Impacts on children education" imply that flooding also disrupted children's education: 38% of respondents reported reduced school attendance and 33% reported temporary school closures, though encouragingly, no permanent dropouts were recorded. On the other hand displacement was reported by 33% of households, though most moved only temporarily, often to relatives' homes (29%) or nearby villages (29%), while only 14% used government shelters.

Relocation during Flooding

The chart "Relocate During Floods", about 29% of respondents relocated to relatives' homes and another 29% to nearby villages, while only 14% used government shelters. This aptitude on informal networks highlights the importance of social ties in disaster coping. Similar patterns have been observed in Bangladesh, where communities prefer family-based refuge over formal shelters (Paul & Routray, 2010).

Preparedness and Early Warning

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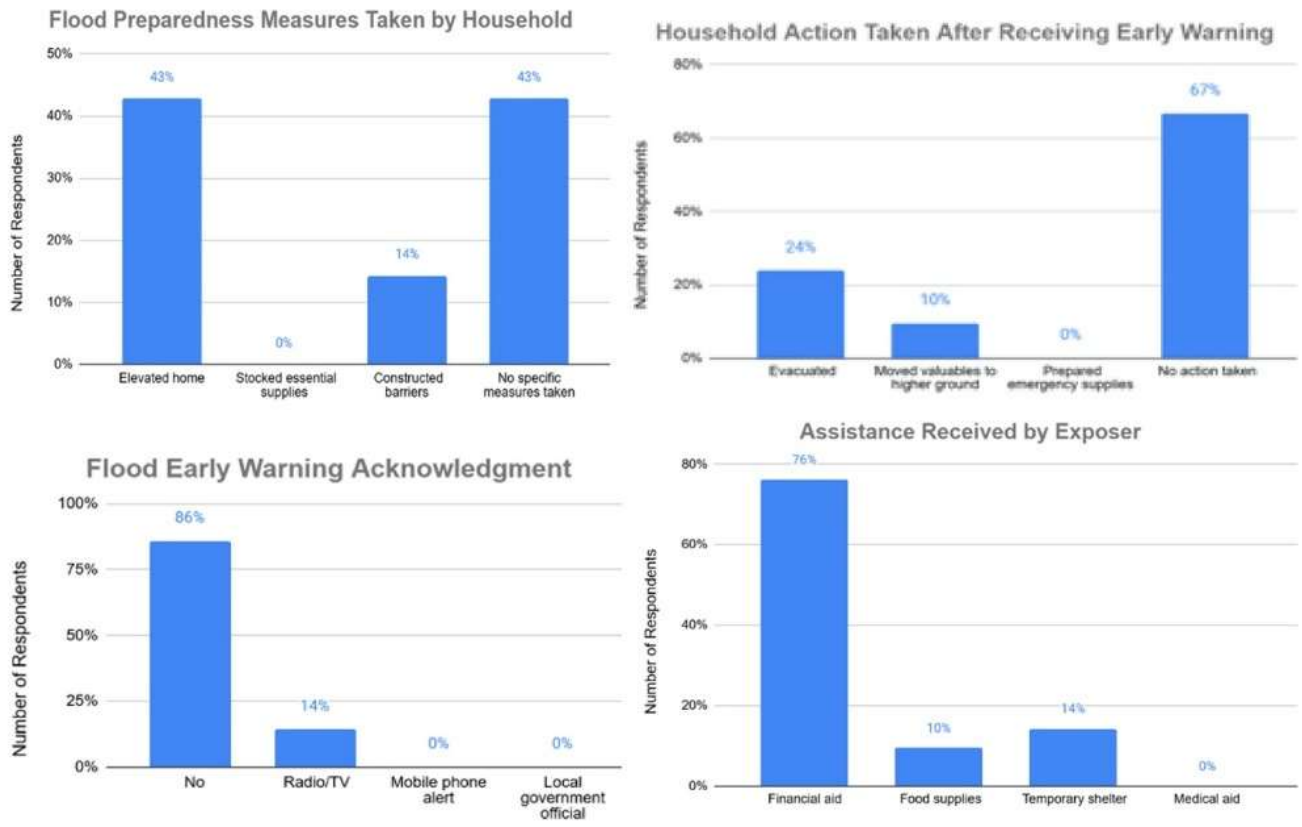

Figure 12: Flood preparedness taken by Household, Household action after receiving early warning, Flood early warning acknowledgement and assistance received by flood exposer of the study area.

We saw from the chart "Flood preparedness taken by Household" preparedness measures were limited. While 43% elevated their houses, another 43% took no action, and only 14% constructed barriers. Early warning systems were significantly ineffective: 86% reported receiving no warning, and of those who did, radio or TV was the sole source.

Besides, in chart "Household action after receiving early warning" we found when warnings were received, 67% of households took no action, while 24% evacuated and 10% moved valuables (Fig. 12). This highlights a meaningful gap between warning dissemination and community response, consistent with critiques of Bangladesh's early warning systems (Sultana et al., 2020).

Post-Flood Assistance

From the chart "Assistance Received by Exposure" relief and recovery assistance were heavily concentrated on financial aid, reported by 76% of respondents. Controry, other supports such as temporary shelter (14%) and food supplies (10%) were limited, while no medical aid was reported (Fig. 12).

The findings of this study demonstrate that flooding along the Gorai River in Jhenaidah District has extensive socio-economic impacts, with agriculture, livelihoods, health, and education being the most severely affected sectors. These results are consistent with broader research on Bangladesh and other flood-prone regions, where recurrent flooding erodes household resilience and perpetuates cycles of poverty and vulnerability (Brouwer et al., 2007; Habiba et al., 2012).

DISCUSSION

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Vulnerability of Livelihoods

According to the survey, it shows that about 60% households primarily rely on agriculture and farming. Limited landholdings, downhill plots are mainly responsible for increasing the risk of significant damages and losses during flood events in this area. Consequently, participants mostly reported losing crops and livestock and indicated how flood events undermine their main sources of income option. Crop and livestock losses were the most frequently reported impacts, aligning with national evidence that agricultural households bear disproportionate flood damages (World Bank, 2010; Paul & Routray, 2010). Limited livelihood diversification means that communities remain heavily dependent on climate-sensitive sectors. These patterns echo findings from similar contexts in South Asia, where agricultural dependency reduces adaptive capacity (Winsemius et al., 2015).

Socio-Demographic Dimensions

Pervasive poverty and low educational attainment are further hampering resilience. Their access to alternative sources of income and knowledge of preparatory measures is limited, since over half of the respondents had only completed primary education or had no education at all. This is consistent with other research that shows that education improves a household's ability to discern early warning signs and implement adaptive measures (Alam & Collins, 2010). As seen by the skewed gender ratio in survey participation, women are underrepresented in flood-related decision-making, although they have greater vulnerability during disasters (Rashid & Michaelsen, 2015).

Health and Basic Services

The study shows significant obstacles in the healthcare system and access to clean water during floods, with 90% respondents having no access to medical facilities. Similar findings have been documented in other flood-prone districts, where physical isolation and weak disaster health infrastructure exacerbate morbidity and mortality (Ahern et al., 2005; Huq et al., 2015). Because of the possibility of contamination, the use of tube wells during floods is still risky, despite being safer than surface water. Additionally, 29% of respondents reported about mental health problems and other psychological effects of disasters that are frequently ignored and are still insufficiently addressed in Bangladeshi disaster management frameworks.

Education and Displacement

Flooding caused temporary school closures (33%) and decreased attendance (38%), though fortunately there were no reports of permanent dropouts. Studies from northern Bangladesh contrast with this finding, where prolonged flooding led to high dropout rates (Rahman, 2017). One-third of households experienced displacement, and the majority relied on relatives or nearby villages rather than government shelters. This reliance on informal networks reflects social norms but also highlights shortcomings in the effectiveness and accessibility of government shelters.

Preparedness and Early Warning

Serious flaws in preparedness and early warning systems have been exposed by this report. Around 86% of households reported that they did not receive any early warning despite national investments in disaster risk reduction.

This is consistent with findings from Sultana et al. (2020) that report inconsistency in early warning transmission. Most households did not take any action even after receiving flood warnings. This lack of response shows several possible problems such as lack of resources, lack of trust or awareness. This ongoing "warning-response gap" is a common challenge in Bangladesh and other developing nations (Basher, 2006).

Post-Flood Recovery and Assistance

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The government and non-governmental organizations played an important role in providing immediate relief, with financial aid, which was the most prevalent type. However, there was little support for food and shelter, and medical assistance was almost absent. This pattern matches general criticisms of Bangladesh's disaster aid system, which prioritizes immediate short-term relief while ignoring long-term livelihood recovery and health services (Alam & Collins, 2010; Paul & Hossain, 2013).

Most households prefer cash-based interventions as the most adaptable and flexible way to manage recovery, as evidenced by the strong preference for financial help (90%) in future preparedness. Although global evidence shows that cash transfers are beneficial in disaster situations (Doocy & Tappis, 2017), relying solely on financial assistance without improving livelihood diversification could increase dependency and heighten vulnerability.

Finding from the Focus Group Discussion

From the focus group discussion (FGD at Langolband) the participant recommends some suggestion to mitigate the river erosion. The recommendation are as follows;

1. Goverment should take immediate step to permanently reduce unplanned and illegal sand extraction from rivers.
2. Construction of permanent embankment and place the geo-bags and permanent block before the rainy/monsoon season.
3. Increase and maintain river navigability through river dredging.
4. Constructing and maintaining embankments by raising both sides of the river and afforestation with trees alongside embankments that have deep and strong roots.
5. Constructing groynes to divert the flow direction and reduce current pressure.
6. NGOs should work closely with local communities to raise awareness, reduce vulnerability, and promote sustainable measures such as tree plantation.
7. To ensure transparency and accountability, the participation of the local government and the community should be ensured in formulating and implementing effective plans.

Knowledge Gaps and Policy Implications

This study highlights a number of significant shortcomings in flood resilience:

1. Insufficient distribution of early warnings compromises preparedness.
2. Households depend on flood-sensitive agriculture because of limited livelihood diversification.
3. Healthcare is extremely difficult to access during floods and is not well integrated into disaster preparedness planning.
4. Women are underrepresented in disaster planning. In order to address these issues, Bangladesh needs integrated resilience-building initiatives that incorporate early warning, education, health, and livelihood diversification which will build long-term resilience rather than short-term recovery.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the socio-economic impacts of flooding along the Gorai River in Jhenaidah District, Bangladesh, with different socio-economic components like as household vulnerability, preparedness, and post-flood recovery. Our study findings demonstrate that floods continue to disrupt agricultural livelihoods, reduce income, damage infrastructure, and compromise access to healthcare, education, and clean water.

Though government and NGOs provide short-term relief, primarily in the form of financial assistance, but long-term resilience remains hindrance by weak early warning systems, limited livelihood diversification, inadequate healthcare services, and the low involvement of women in flood management.

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The results confirm that recurrent flooding not only creates immediate economic losses but also perpetuates cycles of vulnerability, specifically for smallholder farming households. Though community reliance on social networks during displacement and recovery, structural limitations such as poverty, low education, and lack of preparedness reduce adaptive capacity. Addressing these challenges requires more localized, inclusive, and sustainable approaches to flood risk management.

Recommendations

Strengthen Early Warning Systems

- Use SMS alerts, trained volunteers, and grassroots organizations to make flood warnings more inclusive and timelier.
- Promote proactive community engagement through capacity-building workshops and regular emergency response simulations.

Promote diversified livelihood pathways:

- Enterprise support, vocational capacity-building, and develop aquaculture for achieving diversified livelihood possibilities.
- Spread access to microfinance and financial literacy initiatives to resilience household capacity to cope with shocks.

Enhance health and WASH service:

- Sustain emergency medical supplies and deploy rapid-response medical teams and in vulnerable areas.
- Establish climate-resilient WASH infrastructure such as tube wells in elevated area, sanitation facilities secured from flood and mobile purification systems.

Aid in education continuity:

- Develop emergency education strategies, including mobile or temporary learning centers and remote delivery systems.
- Enhance support programs that prevent dropout among girls and vulnerable children during prolonged flooding.

Empower women and marginalized group:

- Promote gender-inclusive governance by integrating women into local disaster committees and post-crisis planning structure.
- Strengthen community resilience through gender sensitive capacity development for preparedness and livelihood rehabilitation.

Stimulate sustainable and long-term resilience building:

- Reinforce financial sustainability by providing short-term financial aid with insurance schemes (e.g., crop insurance) and community savings groups.
- Incorporate indigenous knowledge and community practice in DRR frameworks to foster locally led resilience.

REFERENCES

1. Ahern, M., Kovats, R. S., Wilkinson, P., Few, R., & Matthies, F. (2005). Global health impacts of floods: Epidemiologic evidence. Epidemiologic Reviews, 27(1), 36–46. https://doi.org/10.1093/epirev/mxi008

2. Alam, E., & Collins, A. E. (2010). Cyclone disaster vulnerability and response experiences in coastal Bangladesh. Disasters, 34(4), 931–954. https://doi.org/10.1111/j.1467-7717.2010.01174.x
3. Basher, R. (2006). Global early warning systems for natural hazards: Systematic and people-centred. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 364(1845), 2167–2182. https://doi.org/10.1098/rsta.2006.1819
4. Brammer, H. (2014). Bangladesh's dynamic coastal regions and sea-level rise. Springer.
5. Brouwer, R., Akter, S., Brander, L., & Haque, E. (2007). Socioeconomic vulnerability and adaptation to environmental risk: A case study of climate change and flooding in Bangladesh. Risk Analysis, 27(2), 313–326. https://doi.org/10.1111/j.1539-6924.2007.00884.x
6. CRED, & UNDRR. (2020). Economic losses, poverty & disasters 1998–2017. Centre for Research on the Epidemiology of Disasters & United Nations Office for Disaster Risk Reduction. https://www.undrr.org
7. Creswell, J. W., & Plano Clark, V. L. (2017). Designing and conducting mixed methods research (3rd ed.). SAGE Publications.
8. Doocy, S., & Tappis, H. (2017). Cash-based approaches in humanitarian emergencies: A systematic review. Journal of Humanitarian Affairs, 3(2), 1–22. https://doi.org/10.7227/JHA.0302
9. Gain, A. K., Giupponi, C., & Renaud, F. G. (2015). Climate change adaptation and vulnerability assessment of water resources in Bangladesh. Regional Environmental Change, 15(1), 39–53. https://doi.org/10.1007/s10113-014-0630-1
10. Habiba, U., Shaw, R., & Takeuchi, Y. (2012). Socioeconomic impact of floods in Bangladesh: A case study of Tangail District. International Journal of Disaster Risk Science, 3(1), 1–12. https://doi.org/10.1007/s13753-012-0004-0
11. Huq, S., Khan, M. S., & Rahman, A. (2015). Vulnerability and adaptation to climate change in Bangladesh: Policy perspectives. Journal of Environmental Studies, 24(3), 215–228.
12. Islam, N., & Sado, K. (2000). Flood hazard mapping and risk assessment in Bangladesh. Disasters, 24(3), 1–15. https://doi.org/10.1111/1467-7717.00133
13. Jonkman, S. N. (2005). Global perspectives on loss of human life caused by floods. Natural Hazards, 34(2), 151–175. https://doi.org/10.1007/s11069-004-8891-3
14. Mirza, M. M. Q. (2011). Climate change, flooding in Bangladesh and implications. Journal of Environmental Management, 90(8), 3007–3018. https://doi.org/10.1016/j.jenvman.2011.03.037
15. Paul, B. K., & Hossain, M. S. (2013). Recovery from floods in rural Bangladesh: Coping strategies and livelihood restoration. Disasters, 37(1), 114–136. https://doi.org/10.1111/j.1467-7717.2012.01310.x
16. Paul, B. K., & Routray, J. K. (2010). Flood proneness and coping strategies of rural households in Bangladesh. Disasters, 34(2), 489–507. https://doi.org/10.1111/j.1467-7717.2009.01114.x
17. Rashid, S. F., & Michaelsen, L. K. (2015). Gendered vulnerability and resilience: Insights from Bangladesh floods. Gender & Development, 23(3), 405–421. https://doi.org/10.1080/13552074.2015.1096013
18. Sayers, P., Meadowcroft, I., & Hall, J. W. (2013). Flood risk management in developing countries: Challenges and solutions. Water International, 38(3), 229–240. https://doi.org/10.1080/02508060.2013.785207
19. Sultana, R., Thompson, P., & Rahman, M. (2020). Early warning systems and community response: Evidence from Bangladesh floods. International Journal of Disaster Risk Reduction, 50, 101682. https://doi.org/10.1016/j.ijdrr.2020.101682
20. UNDRR. (2020). Global assessment report on disaster risk reduction 2019. United Nations Office for Disaster Risk Reduction. https://www.undrr.org
21. Winsemius, H. C., Aerts, J. C. J. H., Van Beek, R., Bierkens, M. F. P., & Jongman, B. (2015). Global drivers of future river flood risk. Nature Climate Change, 6, 381–385. https://doi.org/10.1038/nclimate2893
22. Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). At risk: Natural hazards, people's vulnerability and disasters (2nd ed.). Routledge.
23. World Bank. (2010). Bangladesh: Strategic flood management report. World Bank. https://documents.worldbank.org