Vulnerability, Social Dignity and Livelihood Choices of the River Bank Erosion Victims in Bhola District of Bangladesh

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- Upazila Social Service Officers (Tazamuddin, Burhanuddin and Daulatkhan Upazillas)
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Acronyms and Abbreviations

Acronyms	Elaborations
ASA	Association of Social Advancement
BCCSAP	Bangladesh Climate Change Strategic Action Plan
CBO	Community Based Organization
DMC	Disaster Management Committee
EBEK	Ekti Bari Akti Khamar
FGDs	Focus Group Discussions
KIIs	Key Informants Interviews
HHs	Households
NGOs	Nongovernmental Organizations
NPDM	National Planning for disaster Managment
RE	River Erosion
SDGs	Sustainable Development Goals
SFDRR	Sendai Framework for Disaster Risk Reduction
SPSS	Statistical Package of Social Sciences
SSO	Social Service Officer
Tk	Taka
UNO	Upazila Nirbahi Officer
UDMC	Union Disaster Management Committee
UHC	Upazila Health Complex
UP	Union Parishad
UPHC	Union Parishad Health Complex

Executive Summary

This study was conducted on three unions of the Tazamuddin, Burhanuddin and Daulatkhan in Bhola District in Bangladesh. The study used a mixed method approach. The main objective of this study was to explore the vulnerability, social dignity and livelihood choices of the river erosion area of the Bhola District. This study used one set of structured interview schedule to collect data from 371 heads of the households, and separate set of guideline for in-depth case study, focus group discussions (FGDs) and key informants interviews (KIIs). The qualified and trained enumerators were recruited to collect data from household level. Data were analyzed using SPSS software (Version 23).

Demographic and social profile of the respondents

- The demographic data from the selected respondents showed that most of the household heads (88%) were male. From age distribution, the highest numbers were found 26% in the age group 31-40 years of the heads followed by 21.9% age group 41-50 years and 20% age 51-60.
- Among the family members, only 2.65% were found disability.
- The highest 36% were engaged in fishing, followed by 22% day laborer and 10% housewife. A very small number (1%) were unemployed.
- The highest 51% of the respondents cannot sign, 21% primary education, 14% can only sign, 11% secondary school and only 6% have postgraduate degree.

Economic profile of respondents

- The monthly average per household income was found Tk. 13,803 which are much lower than the national rural income (Tk. 18,349 in 2016). The highest 29% households' income was Tk. 10,001 – 15,000, followed by 14% (each) Tk. 15,001 to 20,000 and 20,001 – 30,000, 12% of the households income was Tk. 4,001 – 7,000 and the lowest 5% Tk. 1,000 – 4,000; and below 1% income was Tk. 40,000 and above.
- The Tazimuddin Upazila was found the highest average income earner (Tk. 13,994), followed by Burhanuddin Tk. 13,907 and the lowest Daulatkhan Tk. 13,339. The average asset value per household was found Tk. 2,40,972, where the highest was found from their ornament (Tk. 1,41,147), followed by land Tk. 81,811, livestock Tk. 36,309, cash capital Tk. 18,346, invested resources Tk. 16,609 and boat Tk. 16,811. The average asset value was found highest in Burhanuddin (Tk. 3,08,743) and the lowest Tk. 1,49,108 in Tazimuddin, nearly half than the Burhanuddin Upazila.
- The monthly average household expenditure showed Tk. 15,911, which is bit lower than their income (Tk. 13,803). Only 34% can save and the annual saving amount per household was found Tk. 18,870
- Eighty percent of the households had to pay loan, and its average annual is Tk. 1,14,621. From upazila wise statistics, the people of Daulatkhan spent highest amount of money (Tk. 20,312), followed by Burhanuddin Tk. 15,417 and the lowest Tazimuddin Tk. 13,574.
- The people of the Burhanuddin Upazila could save the highest amount of money Tk. 30,613, followed by Tk. 15,092 in Daulatkhan and the lowest Tk. 8,897 in Tazimuddin.

- The higher number of people used their income for purchasing food (Tk. 7,207), followed by Tk. 2,711 for loan payment, Tk. 2,553 for own recurrent capital like raw materials. They also spent Tk. 1,237 for dowry and Tk. 1,040 for festival. Their spending on health and education were found very low as they spent only Tk. 967 for health services and Tk. 835 for education.
- The land access among the households of Burhanuddin was the lowest, where 39% of the households had no access to land, followed by 28% in Daultkhan and 23% in Tazimuddin.
- Among them who had land access, 88% to 94% have only home stead land in three upazillas. From type of lease land, Burhanudding had 56% cultivable land which was found only 13% in Daulatkhan and no cultivable land was found in Tazimuddin. Data showed that their home stead land susceptibility was found very high, where 79% to 93% (in three upazillas) of their home stead land showed susceptibility to disaster though their cultivable and uncultivable land susceptibility to disaster were found low.

Housing, water sources, latrine and sanitation practices

- 77% to 96% of the river erosion affected people in three upazillas had self-ownership of their houses and 80% to 90% made their houses by their own earning.
- Most of them described their housing condition was fair and bad followed by moderate in all three upazillas. A very small number of people told that their housing condition was good and excellent.
- A high number of people described that their houses were suffered significant and minor damage risks. The highest 59% of the houses in Burhanuddin, 56% in Tazimuddin and 39% in Daulatkhan had this type of risks.
- The access to sanitary latrine showed very poor (only 9%), and this is bit higher (19%) in Daulatkhan Uupazila. Most of the people in all three areas were using the slab with ring toilet. The hanging latrine was using 6% of the households.
- Most of the people used drinking water from the tube-well in all three areas and they had to depend on community, government and neighbor sources. According to the ownership of this source was found highest from the community (39% to 41%), followed by government (14% to 31%), and neighbors (15% to 20%) and then shared in these three areas, but fully own was found very low (2% to 5%). It is remarkable that 29% of them could not meet the sufficient water requirement though these facilities varied 21% to 33% in all three upazillas.
- A noteworthy concern was that a significant number of females (34% to 52%) were not satisfied with the safety issue from these sources of drinking water which was the highest in Daulatkhan.
- Like drinking water, the highest (72% to 93%) used deep tube-well for cooking, a small number of people used pond water (7% to 21%) and river or canal water (1% to 5%) for this purpose though they did not have fully own (only 4%) of this sources rather this was supported by community, government and neighbour, and their water requirements for cooking was not sufficient (22% to 31%).
- Like the sources of drinking water, the safety issues among the females were great concern in those sources, where 62% in Tazimuddin, 52% in Daulatkhan and 37% in Burhanuddin mentioned that these sources were not safe for females concerning safety issue.

Vulnerability

- The river erosion affected people were asked whether they were affected by river erosion between 2013 and 2017, the highest number of people were affected in 2013, and after that, this number decreased gradually except in 2017.
- On an average, every household faced minimum one time of river erosion each year, where nearly 50% of the households mentioned this as the catastrophic type of river erosion.
- Between 2013 and 2017, 36% of the household mentioned that their agricultural land was affected by river erosion and it was average 56.37 decimal per household and its economic value was Tk. 1,85,885.
- 58% of the households mentioned that their homestead was affected by river erosion on that time which was average 28.48 decimal per household and its economic value was Tk. 3,40,094.
- 93% to 99% of the households have school in their locality, but 52% of them mentioned that their local education institutions were fully damaged by river erosion, 12% partially, 7% moderately and 9% did not know. The area wise data does not show any big difference except in Burhanuddin between from 2013 to 2017, where 82% of people mentioned that their education institutions were fully damaged which was only 7% in Daulatkhan. 62% of the household in Tazimuddin mentioned that the river erosion stooped the school, which was 53% in Burnauddin and only 17% in Daulatkhan.
- Daulatkhan Upazila was found safest in terms of continuing education activities during river erosion. The education activity was stopped due to river erosion in certain time as 37% mentioned 1-2 months, followed by 31% 5-6 months and 14% said above 6 months.
- The river erosion affected local people suffered by a number of diseases during river erosion, 67% of them mentioned cold, 66% diarrhea, 54% dysentery, 47% skin disease, 17% cough, 15% malaria and 14% asthma. These sick people looked for treatment from different sources, the highest 62% of them took this treatment from pharmacy, 47% Upazila Health Centre (UHC), 46% village doctor, 29% religious healer, 29% Union Health Complex (UHC), 15% traditional healers, and 13% from the community clinic.
- Though the Government took massive initiative e.g., embankment recently, but data showed that a significant number of people were affected by river erosion in the recent time. They were affected multiply.
- The loss of homestead land was the highest (55%), followed by loss of land (53%), loss of homestead infrastructure (52%), scarcity of pure drinking water (41%), crop loss (30%) and livestock loss (29%). Only 1% of the household mentioned ‘no loss’ by river bank erosion. 50% of the households in Burhanuddin, 30% in Tazimuddin and 21% in Daulatkhan mentioned that they had loss by river erosion.
- 65% of the homestead land was affected in Burhanuddin which was 58% in Tazimuddin and 45% in Daulatkhan. On an average, the number of homestead damaged people was found highest (58%) and agricultural land damaged 36%.
- From the monetary value, the highest 46% of the households’ loss was between Tk. 100 to 20,000, followed by 30% of them Tk. 1,00001 to 5,00000.

Psycho-social vulnerability

- The study explored vivacious information on different psycho-social, cultural and social dignity related aspects from the river erosion affected people by using Likert 7-scales. The overall data showed that all of the respondents were strongly agreed on different aspects of the psycho-social and social dignity related vulnerabilities on their livelihoods.
- Around 70% of the households mentioned that they were strongly agreed on two aspects such as 'river bank erosion has increased poverty in our community' and 'river bank erosion has forced the displacement of the household' followed by other issues such as 'we feel insecurity because of river bank erosion' (64%), we feel helpless during river bank erosion' (63%), 'many schools and social institutions were damaged by river bank erosion' (63%) and 'participation of river erosion victim in recovery process has controlled by the political institutions and local power politics' (62%).
- The food insecurity, breaking socio-cultural bondage and networking, decrease social esteem, and problems of destitute people, and displacement were mentioned by around 50% to 59% people.
- The number of disagree and strongly disagree and even on 'no comment' households were found very low. Data showed that 17% households were strongly disagreed on 'many people in our locality were involved illegal practices due to river bank erosion', followed by 16% on 'child marriage has increased due to river erosion', and 15% on 'my household occupation pattern has changed due to river bank erosion' who were strongly disagreed with this comment.

***Migration and displacemen*t**

- 95% of the households had to displace due to river erosion, where this was 98% in Daulatkhan Upazilla.
- The highest 35% had to displace 1 to 2 times and 32% of them 3 to 4 times.
- 23% of the households displaced twice in the last five years (2013 to 2017), followed by 20% thrice, 12% four times, 11% five times and 9% seven times.
- 44% of the households lastly displaced during 2013 to 2015, even 19% displaced recently (2016 to 2018).
- The erosion affected households mentioned multiple causes behind of their displacement. The highest number (83%) mentioned that they were displaced in order to avoid river erosion in future, followed by 36% avoid inundation, 34% loss of homestead, 27% to protect household from cyclone and 24% to avoid water logging
- The highest 30% of the households were displaced to the embankment, 22% to relatives' house and 16% to the government and non-government's shelters. Only 19% were displaced to their own land in another places. Below 1% of the affected households displaced at school and adjacent villages.
- 46% of the households mentioned that they were thinking to a plan displacement and 54% mentioned 'no'. They showed a number of reasons for such plan displacement, the highest 70% of them mentioned to avoid river bank erosion further, 42% to avoid disasters, 33% to avoid inundation and 19% to avoid water logging. 32% of the households wanted to displace for better life and 9% each for lack of employment and influence of power structure.
- The household heads were asked whether their family members migrated to other places for livelihoods due to river erosion, data showed that a very small numbers of

them were migrated to other places which was found highest in Burhanuddin (29%), 15% in Tazimuddin and only 8% in Daultkhan.

- A small number of people migrated other places for permanently which was the highest (16%) in Burhanuddin, 10% in Tazimuddin and 9% Daulatkhan.

Livelihood options/choices

- 78% in Daulatkhan, 72% in Tazimuddin and 57% in Burhanuddin depended on natural resources for income and consumption.
- They were engaged in different types of activities, among those, the highest 85% of them were catching fish, followed by 22% crop cultivation. The rest of the people were engaged in livestock rearing, and shrimp larvae.
- Main income related livelihood options were mentioned as catch fishing labourer (47%), day labourer (44%), catching fish own (33%), crop cultivation (15%), small business (14%) and livestock rearing (10%).
- 83% of the households in Tazimuddin, 55% in Daulatkhan and 39% in Burhanuddin were not satisfied with their current livelihood options as they faced a number of problems. The problems include lack of capital (52%), lack of knowledge about climate adaptive livelihood options (44%), lack of skills in managing livelihood options (42%), plash food (41%), damage land due to salinity, and water logging (34%).
- The highest number of people (such as 64% in Daulatkhan, 55% in Tazimuddin and 33 in Burhanddin) did not changed their livelihoods between 2013 and 2018 though they were facing a number of problems. Only 17% to 20% of the households were partially changed this and only 25% in Burhanuddin and 18% in Tazimuddin fully changed their livelihood options during river erosion.
- Nearly 93% of the family members of the households had to engage for income during river erosion, out of these, minimum 1 person was engaged among 45% (51% in Daultkhan and 49% in Tazimuddin upazilas), 2 persons among 29% households and 3 persons among 15% households.
- They took skills trainings mainly from three types of institutions such as NGOs (61%), government institutions (32%) and Islamic Relief (14% in Tazimuddin).

Coping strategies and resilience

- The study team asked to the respondents about the types of disasters were more frequent in their locality except river erosion, they mentioned a number of disasters that include salinity, cold wave, tidal surge, cyclone, and flash flood. The highest 83% of the respondents mentioned cyclone, followed by 61% flash flood, 33% salinity, 28% tidal surge, and 19% cold wave.
- 56% of the households mentioned that they did not take any pre-caution against hazards at their household level, and 44% told that they took this pre-causation.
- They took a number of pre-cautions to protect the hazards. The highest 6% of the households had ready dry food and around 22% to 37% had ready of moveable woven, savings, fire wood, tiding house, plinth rising, and tree planation. A very few households (only 4%) mentioned that they had first aid box. 75% mentioned that they had land protected embankment.

- Only 5% received training on disaster management, and 14% had idea about Disaster Management Committees (DMCs). 52% of the households tried to reduce cost during river erosion and 15% sent income to other places as disaster management.
- During river erosion, 28% went to the shelter centres, 15% took shelter at their relatives' houses and 19% of the households stayed at their own houses, and 15% had to stay at embankments of the rivers.
- The households followed a number of ways to reduce their cost during river erosion such as the highest 87% took less food, 63% had to borrow money from different sources, 44% cut down their clothing and other costs, and 31% borrowed food from relatives and neighbours.
- 25% of the households had no place to keep their cattle during river erosion, 16% kept their cattle in their own houses and 12% on the embankments. Only 7% mentioned that they kept their cattle at cattle shelter, 32% of the households mentioned that they had to sell their cattle for cash money due to shelters/places and financial crisis.
- The households did not have any place (24%) to keep their grain during river erosion, 27% of the households kept this in their own house and 7% had to sale their grain.
- They conceived a number of losses by river erosion such as crop loss (41%), cattle loss (36%), injured (22%) and life loss (6%).
- The storage system was not sufficient in the areas as 60% of them stored their crops at their own household and less than 1% in the local bazar. Only 1% of the people had opportunity to store their crops at government storage and community based seed bank.
- During hazards, only 9% in Tazamuddin, 10% in Daultkhan and 13% in Burhanuddin received assistance from the Union Disaster Management Committee (UDMC). From government side, these numbers were found only 12%, 8% and 16% respectively in three upazillas.
- A higher number of river erosion affected people reported that they did not get relief that is very common in Bangladesh. The number was more than triple in Tazimuddin upazila (25% and 75% respectively), 65% in Burhanuddin and 58% in Daulatkhan.
- The households who received this relief reported that they received this relief from mainly four sources, such as government, NGO, community and individual. Among those, the highest one was from government (32%), followed by 12% NGO.
- Among the receivers, the highest 92% of the households received food, 21% cloth, 21% medicine, 14% shelter and only 10% cash money.
- Their satisfaction level on relief operation was varied widely among the households of three areas. The highest numbers of them were moderately satisfied (26% to 34% in three areas), then dissatisfied (19% to 25%) and finally highly dissatisfied (17% to 35%). The highest 35% of the households were highly dissatisfied in Tazimuddin and again 35 satisfied in Daulakhan and 34% moderately satisfied in Burhanuddin.
- The highest number of people (78% to 84%) in all three areas reported that they did not get assistance from government for recovery and construction. The households who got this assistance reported that the highest 64% of them received relief, 40% food, 17% each family shelter repairing and cash money.
- The people gave very positive response towards to take permanent measures to stop the river bank erosion as 96% in Burhanuddin, 81% in Daulatkhan and 78% in Tazimuddin say this response.

- The government took a number of initiatives to reduce displacement by river erosion. Among those, 80% of the affected households mentioned construction of embankment and 18% tree planation.
- The highest number of people (33%) were highly satisfied on this government initiative, followed by satisfied 29%. Only 16 of them were dissatisfied and 8% was highly dissatisfied. From areas wise data, this number did not vary significantly though this number of satisfied people in Daulakhan were found higher (40%).
- The people gave a negative impression about NGOs' initiative in the recovery process, where 81% to 88% in all three areas mentioned that the NGOs did not take initiative in the recovery measures. Only 10% to 15% of the people gave positive impression about the NGOs' activities.
- These people mentioned a number of recovery measure such as 71% awareness building, 56% needs assessment, 22% CBO formation and 5% provided seed money.
- The affected people followed a number of indigenous coping strategies against river bank erosion though 23% of the households mentioned that they did not take any action. Among them, 42% mentioned portable oven, 39% dry food, 34% homestead raising, 23% tree plantation, 18% saving and only 9% first aid box.
- Most of the households (85% to 94%) in all three areas did not participate in decision making process of recovery and construction planning and programme during river bank erosion.
- Like recovery planning and programme, the highest number of people (86% to 94%) in all three areas did not participate in the implementation process of recovery and reconstruction planning and programme.
- The household heads were asked to explain the development of decision making process after river bank erosion in their locality, in reply of this, the highest 53% of them mentioned 'no access' in this process, 34% mentioned that the decision making process was controlled by the local power politics, 8% limited access and only 5% mentioned fully access.

Food Security

- The first and last month (Boishakh and Chotra) of the Bangla year were difficult time for the river erosion affected people, where the numbers of two meals and one meal were found higher. The months of Joshtho and Falgun were also bad months for them. For example, in Boshakh 23% of the people had two meals and 2% had one meal which were 31% and 4% in Chotra respectively. These numbers were found 9% and 3% in Joshtho and 16% and 1% in Falgun months respectively.
- In Ashar, 11% people had two meals that was not significantly varied in the rest of the months.
- The number of people who had one meal was found very small and in many months were found zero.

CHAPTER 1
INTRODUCTION

Study background

This research project was conducted with the technical and financial supports of the Islamic Relief Worldwide, Islamic Relief (IR) is an international humanitarian and development organization which was founded in 1984, with headquarters based in Birmingham, United Kingdom. Presently, it is conducting humanitarian services in 44 countries. IR has a vision to ensure the empowerment of the community people from all spheres, where this organization supports each other's' sufferings in order to fulfill its obligations. It works for the worlds' most vulnerable people in the fight against poverty and sufferings. Islamic Relief Worldwide started operating in Bangladesh in 1991, when the Bangladeshi people met the devastation of mighty cyclone. IR provided emergency relief and supports to the communities to rebuild and overcome the aftermath. Islamic Relief, Bangladesh (IRB) is running different projects in 22 districts in Bangladesh. IRB has taken programmes focusing on both humanitarian and development challenges to promote sustainable economic and social development by working with the local communities. As one of the core programmes, the Livelihood and Community Development (L&CD) Programme has started implementing its activities since 1995 and this programme is implementing the "Integrated Sustainable Development Project for the Climate Vulnerable Ultra Poor Communities of Southern Bangladesh" (ISD Climb UP) that aims at addressing the poverty and climate vulnerability of three Upazillas such as Burhanudin and Daulat Khan (sub-district) under Bhola district in Bangladesh.

This study report represented the whole Bhola district, the southern part in the country and located closed to the Bay of Bengal. This is the largest riverine delta island of the world became a sub-division in 1845 bearing the name of South Shahbazpur. At that time, it was a part of Noakhali district which was then transferred to Barisal district in 1869. The sub-division was renamed as Bhola in 1876 when its headquarter was shifted from Daulatkhan to Bhola. It was upgraded to a district in 1984. It is bounded on the north by Barisal District, on the east by Lakshmipur and Noakhali districts, and on the west by Barisal and Patuakhali districts. It lies between 21°54´ and 22°52´ north latitudes and between 90°34´ and 91°01´ east longitudes. The total area of Bhola is 3403.48 sq.km (1314.08 sq.miles) of which 1456.87 sq.km. is under forest. Bhola district (Barisal division) an offshore island with an area of 3403.48 sq km, is bounded by Lakshmipur and Barisal district on the north, Bay of Bengal on the south, Lakshmipur and Noakhali district, the Meghna (lower) river and Shahbazpur Channel on the east, Patuakhali district and Tentulia river on the west. Zahiruddin, Patila, Dhalchar, Kukri-Mukri and such other chars of different sizes have formed at the river mouths. The highest temperature is 32.7°C and lowest 11.6°C and annual rainfall is 2360 mm. The noted rivers are the Kalabador, Lower Meghna, Tetulia, Ilisha.

The economy of Bhola is predominantly agricultural. Out of total 347,515 holdings of the district, 64.01 % holdings are farms that produce varieties of crops namely local and HYV rice, wheat, vegetables, jute, spices, cash crops, pulses, and others. Various fruits like banana, mango, guava, jackfruit, black berries, coconut, papaya, palm, lichi, dates etc. are grown. Fish of different varieties abound in this district which enjoys the advantages of marine fishing. More varieties of fish are caught from rivers, tributary channels and creeks and from paddy

fields during rainy season. Hilsa, a popular fish of the country, is abundantly available in the district. Dry fish is an important source of income to the fishermen. In the fresh water the popular species are ruhi, katla, marigale, kalabous, airh, ghania, shaol, boal, gagar, gulsha, kai, shing, magur etc. Besides crops livestock and fishery are the main sources of household income. The basic information of the Bhola district is presented in the Table 1

Table 1.1: Basic information of Bhola District

Upazilla of Bhola district	Population (000)	Households	Unions	Land area	River area	Literacy rate	River flows	Flood camps/ shelter	River erosion
Bhola Sadar	430520	88068	13	368.74	44.42	45.2	2	10	Yes
Burhanuddin	233860	48534	9	255.65	29.01	47.9	2	0	Yes
Char Fasson	456437	94649	19	517.74	533.87	43.5	3	0	Yes
Daulatkhan	168537	34670	9	290.57	26.42	41.6	1	1	Yes
Lalmohan	283889	60988	9	298.62	70.24	40.0	2	3	Yes
Manpura	76582	17080	4	130.81	186.97	32.1	1	0	Yes
Tazumuddin	126940	28734	5	242.46	242.53	42.9	1	2	Yes
Total	**1776765**	**372723**	**68**	**2104.59**	**1133.46**	**43.2**	**12**	**16**	-

Source: BBS (2013)

Study objective

- To know the present social and economic conditions of the river erosion victims in three Upazillas e.g., Tazumuddin, Burhanuddin and Daulat Khan under Bhola District;
- To assess the mental/psychological condition of the river erosion victims;
- To determine the rate/magnitude of forced/involuntary migration due to river erosion;
- To identify the specific social and economic changes brought by river erosion;
- To measure the factors of involvement of power politics because of river erosion;
- To know the social dignity of the river erosion victims; and
- To identify the livelihood options of river erosion victims;

Key research questions

- What are the current social and economic conditions of the river erosion victims in Tazumuddin, Burhanuddin and Daulat Khan under Bhola district?
- What are the mental/psychological condition of the river erosion victims?
- What is the magnitude of forced/involuntary migration due to river erosion?
- What are the specific social and economic changes fetched by river erosion and why?
- What are the factors of the involvement of power politics because of river erosion and how?
- How is their social dignity of the river erosion victims? and
- What are the livelihood options of river erosion victims?

Scope of the study

- Review the relevant study reports, documents, articles, books, etc.;
- Design conceptual framework, qualitative and quantitative data collection tools, sampling methods, field survey schedule and other relevant things required for the study;

- Conduct discussions/meetings/interviews with relevant people - political leaders, government officials, academicians, policy makers, NGO activists;
- Collect data and information from different levels and stakeholders including project beneficiaries, community leaders, project team, relevant I/NGOs, and government officials;
- Process and analyse field data with suitable software;
- Finalize the study report incorporating all feedback and submitting to IRB;
- Arrange a national/regional sharing session on study findings and recommendations;
- Submitting both hard and soft copy (CD) of the final report, presentation and database (3 sets).

Significance of the study

A half of the world population are now living with a close distance of the coast and river bank areas in the world with immense socioeconomic and health related risks, threats, and hazards. River erosion is one of the major natural calamities of Bangladesh that took place in almost every year. The people of Bangladesh are highly vulnerable to this river erosion. It is said that it is one of the most unpredictable and critical type of disasters that takes into the country because of quantity of rainfall, soil structure, river morphology, topography of river and adjacent areas, and floods (Hoque and Haque, 2013). The catchment area of the major rivers is about 1.65 million square km of which only 7.5% lies within the border of Bangladesh that generates 1200 km3 of run-off annually, only 10% of which is generated within Bangladesh (CEGIS, 2000; Sarker et al., 2003). In addition to vast quantities of water, these rivers carry about 1.1 billion tons of sediment every year and are responsible for the prevalence of flooding and river erosion in Bangladesh (Elahi et al, 1991; Hoque and Haque, 2013). The Center for Environment and Geographic Information Services (CEGIS, 2009) reported that the Jamuna and Padma rivers have widened more than three kilometers and destroyed about 130000 hectare of floodplain land.

In Bangladesh, some rivers cause erosion in large scale and high frequency due to their unstable character. These rivers assume a braided pattern consisting of several channels separated by small islands in their courses (Banglapedia, 2015). During the last 200 years or so, the channels have been swinging between the main valley walls. During the monsoon, extensive overbank spills, bank erosion and bank line shifts are typical. The gradual migration or shifting of channels of the major rivers in Bangladesh amount to anywhere between 60m to 1,600m annually (Banglapedia, 2015). Coastal and riverine house-holds in Bangladesh are the most susceptible to the impacts of climate-driven hazards including riverbank erosion (GoB, 2010); recent models of hydrological impacts of climate change in different climatic zones have shown this to be true across Asia (Eregnoet al., 2013). Moreover, Bangladesh has a monsoonal climate that creates frequent and heavy rainfall resulted in higher frequency of catastrophic flood in the country (Huq et al., 1996). Increased monsoonal flows result in an increased sediment transport capacity and morphologic dynamics of the rivers which lead to increase riverbank erosion along the GBM rivers (Ahmed and Chowdhury, 2006; Huq et al., 1998; Warrick and Ahmad, 1996). River channels may shift laterally >300 m seasonally and frequent flooding causes bank erosion and land loss (Makenro, 2000) along the estimated150,000 km of river-banks in the country (Hutton and Haque, 2003).It has been estimated that 20 out of 64 districts within Bangladesh are prone to river-bank erosion (CEGIS, 2012) and 8700 ha of land are lost each year to river processes displacing approximately 200,000 people annually and

impacting on the lives and livelihoods of riparian households (Alam, 2016; Ahmed, 2015; Lein, 2010; Huttonand Haque, 2004, 2003; Haque, 1997; Elahi et al., 1991; Zaman,1989), causing food insecurity and poverty (IFAD, 2013; Haque and Rabbani, 2011; GoB, 2010).

There are a number of rationales that the research was conducted. First, the degree of economic loss and vulnerability of population due to bank erosion has dramatically increased in recent years. Secondly, the impact of land loss involves primarily the loss of homestead land, housing structures, crops, cattle, trees and household utensils. Thirdly, loss of homesteads forces people to move to new places without any option and puts them in disastrous situations. The Banglapedia (2015) recorded that about one million people are directly affected each year by bank erosion in the country. The total monetary loss is estimated to be approximately $500 million a year. An estimated 300,000 displaced persons usually take shelter on roads, embankments and government-requisitioned lands. Displacement is the immediate impact of riverbank erosion. It was found that in erosion-prone areas, most families have witnessed a displacement in their lifetime. This involuntary movement can go up to 10 times or even more (Banglapedia, 2015). Fourthly, the vulnerability situation assists to increase the overall vulnerability in Bangladesh due to river erosion. However, the vulnerability indicators/indices can be used as an instrument for evaluating development policy frameworks (Eriksen and Kelly,2007); provide information for developing adaptation and mitigation plans (Gbetibouo et al., 2010); and for comparison of different contexts, and monitoring vulnerabilities over time and space, and setting priorities in resource allocations for adaptation and mitigation (Preston et al., 2011). However, from policy implication context, this study can provide some valuable suggestions in order to overcome the development challenges to particularly disaster affected people in river-prone and coastal areas in Bangladesh.

To address the development programmes and initiate appropriate social, economic and environmental policies, it is important that accurate information on livelihood vulnerability is important, particularly for marginalized riparian communities. Indeed, it has been argued that policy interventions would do little to affect poverty dynamics unless the context of household vulnerability is properly understood (IPCC, 2014; Shah et al., 2013; Hahn et al., 2009). GoB (2011) has emphasized the need to identify the most vulnerable sectors and geographical areas impacted by climate change and this study aims to fill this critical gap. Therefore, gaining a better understanding of the river's behavior should contribute to mitigate these sufferings and also to reduce the possible damage of the river to public infrastructure towards a better livelihood options.

Expected outcomes from the study

- To identify the present socio-economic condition, educational status, social dignity and status, livelihood condition and options, water, sanitation, health, hygiene and healthcare seeking behaviour of the people who have been affected by river erosion;
- To identify effective and appropriate way forward/solutions for improving the overall situation of the river erosion-affected people and to make sustainable impact towards their lives, livelihood options, social dignity and socio-economic conditions;
- To understand the involvement of local power politics with the people affected by river erosion;
- To assess the socio-economic changes brought by river erosion with special emphasis on involuntary/forced migration;

- Arranging a national/ regional sharing session on the findings and recommendations of the study where policymakers/decision-makers from relevant ministries, MPs, political leaders, government officials, departments and research institutions, representatives from I/NGOs, participants from the study and other

Responsibility Matrix

On the basis of the above discussion responsibilities of each key professionals have been identified and presented following responsibility matrix:

Responsibility Matrix for Key Professionals

Activities	TL	RA	DMS
Review of existing documents	■	■	
Planning of survey	■	■	
Design and finalization instruments and pre-testing	■	■	■
Recruitment and training of field staffs	■	■	
Finalization of the sample size and study location	■	■	
Development of study program and inception report	■	■	
Data collection and quality control	■	■	■
Data management and analysis	■		■
Report writing, presentation and Finalization	■	■	

TL: Tea Leader, RA: Research Associate; DMS: Data Management Specialist

Timeframe/Work Plan

Effective and practical work plan is an important factor for timely completion of the project. In order to complete the tasks assigned under the project, the whole activities are to be performed as per scheduled time frame. A work plan depicts the activities and given time periods for completion of each activity, which ultimately helps complete the whole job within scheduled time frame. The work plan is based on the "approach and methodology" of our proposal. This activity schedule/work plan will be reviewed and refined at the stage of project inception. In line with the time frame mentioned in the TOR a work plan for a period of 90 days has been prepared and presented in Table-7. Any delay of signing the contract will lead to delay in commencement of work and accordingly the time planned for individual activity may be shifted.

Table: 1.2 Work/Activity Schedule with Time Frame

Activities	Days (starts from 15 March 2018 – 15 June 2018)									Responsibility
	1st 10 days	2nd	3rd	4th	5th	6th	7th	8th	9th	
Go through the project documents and relevant literatures by the consultant and work with Islamic Reliefs to finalize indicators for data collection										Consultation with Islamic Relief
Develop questionnaire and other data collection tools by the consultant										Consultation with Islamic Relief
Orientation/training of the data collector/enumerator on questionnaire, field and data collection procedure										Consultant
Pre-test of the questionnaire and other tools and finalize the tools based on pre-test findings										Consultant
Data collection										
Mid evaluation (arrange a workshop with Islamic Relief Head Office)										
Develop data entry format in Excel/ Access /SPSS and data entry										Consultant
Data analysis										Consultant
Prepare Draft Report										Consultant
Submit Final report (soft copy and printed format) and soft data sheet to Islamic Relief										Consultant
Organize a workshop for sharing and suggestions										

CHAPTER 2
LITERATURE REVIEW: CONCEPTUAL AND THEORETICAL FRAMEWORK

Introduction

Bangladesh is a disaster risk hot spot, ranked fifth in the top 15 countries with the highest risks among 173 nations in the world (World Disaster Report 2012; Shaw et al. 2013). Due to a unique geographical position, the country is highly vulnerable to regular and severe natural hazards, including floods, tropical cyclones, storm surges, landslides, and drought. These hazards, combined with an extremely high population density and poor socioeconomic condition, are already leading to the partial and total destruction of housing, land and property, loss of livelihoods, and widespread migration and displacement across the country, where more than 50 million people live in poverty (Displacement Solutions and YPSA 2014). The extensiveness of natural calamities and geographical context has already led to Bangladesh being identified as one of the highest risk and most disaster-prone countries in the world (Rahman et al., 2017). It is globally know that Bangladesh is a land of rivers. More than 700 rivers, with their tributaries and distributaries have crisscrossed the country forming a network of river system. It has about 2,400 kilometers of bank line and along with the bank line there are 283 locations, 85 towns and growth centers are vulnerable to erosion1. The Padma (The Ganges), the Jamuna and the Meghna, major rivers of Bangladesh, erode several thousand hectares of floodplain, making thousands of people landless and homeless every year (Islam and Rashid, 2011). Bangladesh is vulnerable to climate-driven hazards, including river-bank erosion causing the loss of land and associated natural resources of riparian households, which threatens the livelihood, health and food security of these vulnerable communities (Alam et al., 2017).

Gravgaard and Wheeler (2009) stated that in Bangladesh 50–200 thousand people are displaced by the river erosions and 600 thousand people by the extreme impacts each year, and 25 million people by the sea level rise alone over the next 40 years. Over the last decade, the rising sea levels, tropical cyclones, flash floods, soil salinity, and river erosion have emerged as the environmental or climatic push factors that have highly forced and exposed in the vulnerable coastal communities to migrate. The Christian Aid (2007) reported that approximately 250 million people will be permanently uprooted by the climate change-related phenomena by 2050 that Myers (2008) estimated it as one of every forty-five people of the world. 13% of the global population lives in coastal areas lying\10 m above sea level (UN-Habitat 2011). Dasgupta et al. (2010) reported that 8.06 million inhabitants in the low-lying coastal Bangladesh are badly exposed to the vulnerability to storm surge-related inundation, and the number will increase 110 % with the population growth by 2050 with rapid climate variation, if further adaptation measures are not immediately undertaken.

Since independence in 1971, Bangladesh yet remains a low-income country with nearly 50 million people still living in poverty and impacted by climate change (World Bank, 2013). According to the latest estimation from the Internal Displacement Monitoring Centre (IDMC) that records more than 42 million people were displaced in Asia and the Pacific between 2010 and 2011 which is more than twice the population of Sri Lanka. This figure includes those

displaced by storms, floods and heat and cold waves (ADB 2012). Hundreds of thousands more are still displaced following disasters in the previous years. The Centre noted that since 2008, an average of 26.4 million people per year have been displaced from their homes by disasters brought on by natural hazards (IDMC 2016). This is equivalent to one person being displaced every second (Islam and Khan, 2018).

Environmental and climate factors have a long impact on migration flows, as people have historically left places with harsh or deteriorating conditions (IOM, 2016). Over the last two decades, the number of recorded natural disasters has doubled from some 200 to over 400 per year. Nine out of every 10 natural disasters today are climate-related. The Norwegian Refugee Council indicated that as many as 20 million people were displaced by climate induced sudden onset natural disasters in 2008 alone (Elverland, 2009). Worldwide, sudden onset hazards such as earthquakes, floods, landslides and tropical storms displaced some 165 million people between 2008 and 2013. On 12 March 2015, a Category 5 tropical cyclone hit the Pacific islands of Vanuatu that was stronger than anything previously experienced on the islands – it affected 166,000 inhabitants, leaving 75,000 of them without adequate shelter and 110,000 in need of fresh water (Brende and Burkhalter, 2015). It is assumed that both sudden and slow onset climate-related hazards combined with rapid urbanization, population growth and pre-existing social vulnerabilities and poverty are likely to increase displacement and migration in the future (Islam and Shamsuddoha, 2017).

This study was conducted on Bhola District that is located at the southern and coastal zone of Bangladesh. The Coastal zones in Bangladesh, naturally very dynamic and economically highly productive have been adversely affected by the impact of extreme natural events like tsunami, cyclonic storm surge, severe erosion and increased sea surface temperature as a result of global climatic changes over the past century (Hansen et al. 2001; Trenberth et al. 2007; Islam, Hossain and Murshed, 2015). Being a unique geographic location, low topography, and relatively higher population density as well as overwhelming dependence on natural resources, Bangladesh is one of the vulnerable countries exposed to the impacts of global warming and climate change. Eventually the coastal environment will experience the adverse effect because of coastal erosion, flooding near river mouth and low lands, frequent shifting of channel courses, deterioration of water quality in estuaries and aquifers, uneven storm surge and severe cyclone. The rise of sea level is not uniform throughout the coast of Bangladesh. For instance, deltaic region shows relatively low trend whereas the western part of the Meghna River estuary, including the islands of Bhola, Manpura and Hatiya shows higher trend due to huge sediment load with compaction induced subsidence (Sarwar 2013; Islam, Hossain and Murshed, 2015). Bhola, the world's most dynamic estuary is potentially vulnerable to accelerated sea level rise and associated calamities (Islam, Hossain and Murshed, 2015). This study attempts to explore the vulnerability, social dignity and livelihood choices of the river erosion victims of this district.

This study has been underpinned three main concepts such as vulnerability, social dignity and livelihood choices, where river erosion is the main focus. The study looks the interrelated components and interlinking issues related with these three concepts. The figure 2.1 has frames this conceptual framework of the study.

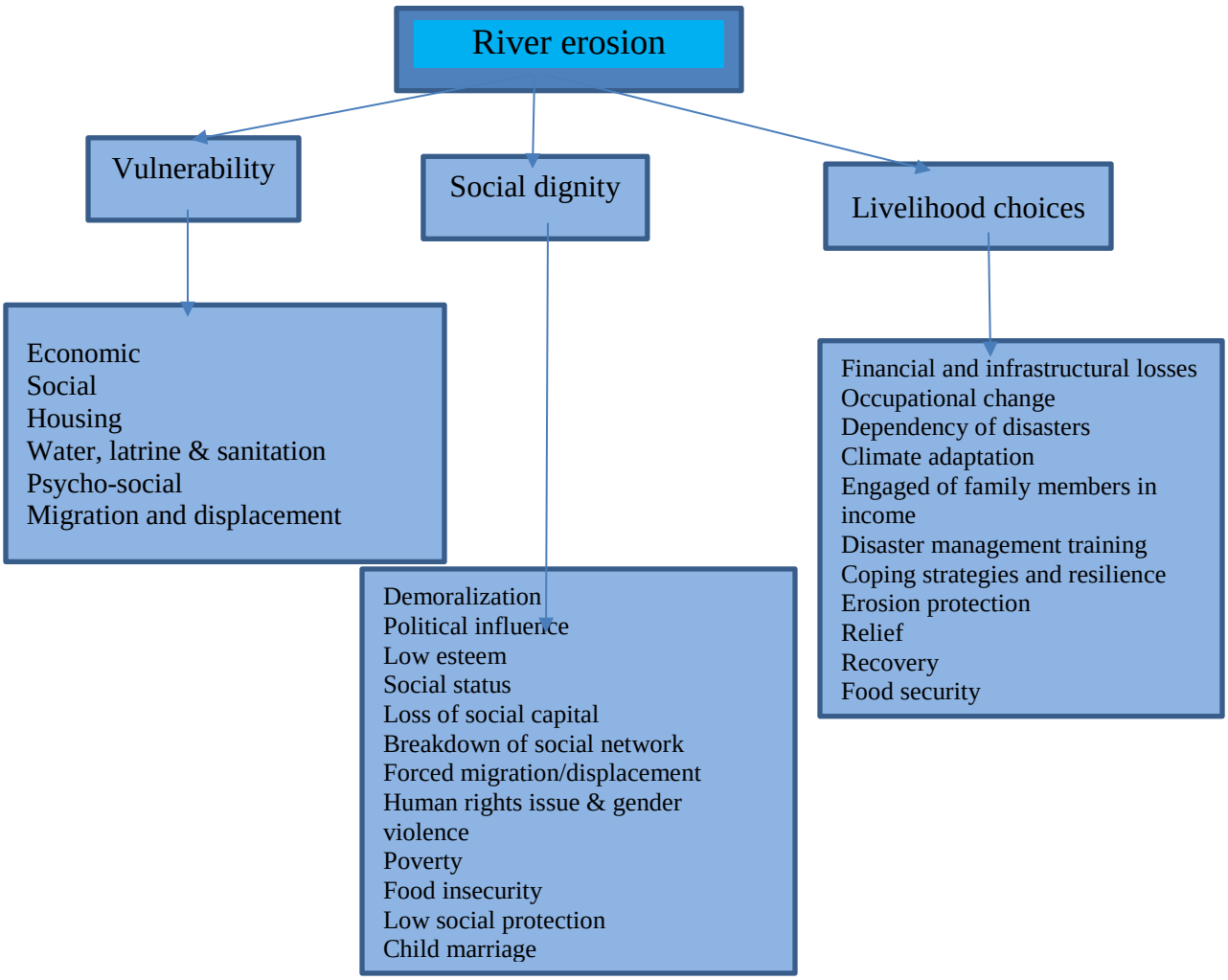


Fig. 2.1: Conceptual framework of the study, **Source**: Prepared by study team

Conceptual framework

Vulnerability

The word 'vulnerability' has emerged as a central concept for understanding what it is about the condition of people that enables a hazard to become a disaster (Tapsell, et. Al., 2010). Although 'vulnerability' is a difficult concept to define and operationalize, the term has been adopted as standard vocabulary in development and poverty studies, global environmental change literature, and hazard and disaster research (Cutter, 1996; Hogan and Marandola, 2005; Agder, 2006). Within the field of hazard research, vulnerability studies first emerged as a critique of the mainstream technocratic hazard studies (e.g. Burton *et al.*, 1993) but are now established as a dominant approach within social science-based studies of hazards and disasters. Vulnerability studies have succeeded in shifting the focus in framing disasters as outcomes primarily of natural geophysical events to a focus that includes the social forces that render certain groups and societies more exposed to the destructive effects of certain hazards. The vulnerability is more contextual as the conceptual nexus links the relationship that people have with their environment to social forces and institutions and the cultural values that sustain

or contest them' (Oliver-Smith, 2004), thereby providing a framework for capturing and analyzing the multidimensionality of disasters, and better informing programmes for recovery and mitigation.

A number of referred definitions are available in the literature. For example,

> Vulnerability has been defined as a characteristic of individuals and groups of people who inhabit a given natural, social and economic space, within which they are differentiated according to their varying positions in society into more or less vulnerable individuals and groups. It is a complex characteristic produced by a combination of factors derived especially (but not entirely) from class, gender and ethnicity (Cannon, 1994).

A more complex definition of vulnerability – emphasizing peoples' and societies' capacities, not just their inabilities and insufficiencies – is provided by Wisner *et al.* (2004: 11):

> Vulnerability is the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard (an extreme natural event or process). It involves a combination of factors that determine the degree to which someone's life, livelihood, property and other assets are put at risk by a discrete and identifiable event (or series or 'cascade' of such events) in nature or in society.

Kelly and Adger (2000) stated:

> Vulnerability is the ability or inability of individuals or social groups to respond or adapt to, cope with, or recover from, any external stress placed on livelihoods and well-being.

Most vulnerability literature has emphasized the physical and ecological vulnerability of coastal areas (Islam and Shamsuddoha, 2017; Islam, 2018). The natural hazard literature has tended to emphasize hazard assessment, and has placed less effort on estimating economic or behavioural responses (Felsenstein and Lichter 2014). A significant number of studies have focused on climate change related vulnerabilities (Kelly and Adger 2000; Cutter et al. 2003; Hesselberg and Yaro 2006; Adger 2006; Snover et al. 2007; Fussel 2007; Amos et al. 2015; Bergstrand et al. 2015; Simane et al. 2016). From a socioeconomic perspective, it is not so much magnitude of the event that is important, but rather the ability of people to cope with its results (Felsenstein and Lichter 2014; Islam, 2018). The asset vulnerability framework is based on the work of Caroline O. N. Moser; where vulnerability is being defined under some frameworks. According to her, it should be the policy to identify what the poor have (asset), rather than what they do not have to cope with vulnerability (Moser, 1988). She defines assets of poor in two groups, tangible assets, such as labor and human capital, and productive assets, such as housing, as well as intangible assets, such as household relations.

There is a close linkage among vulnerability, assets and poverty. From the result of the frameworks of Moser, it has been found that the poor themselves are managers of complex asset portfolios. In her framework, the concept vulnerability is being linked and schematized under five categories and then she ends in a conclusion that asset management may reduce the household vulnerability (Moser, 1998). Vulnerability is more dynamic and better captures change processes as 'people move in and out of poverty' (Lipton and Maxwell, 1992). It is true that poor people are usually among the most vulnerable group, but not all vulnerable people are poor, a distinction which facilitates differentiation among lower-income populations. Again vulnerability does not always mean the disaster of poor rather vulnerability stands for

the possibility to fall in disaster. It has been found that hazard by itself is not a disaster unless there are vulnerable populations who do not have the capacity to absorb it and who are unable to cope with it (O'Neil, 2010).

A number of authors such as Cutter et al. (2003), Hahn et al. (2009), and Shah et al. (2013), used economic, social, and natural factor indicators to measure vulnerability. A number of authors such as Turton (2000), Knutsson and Ostwald (2006), and Amos et al. (2015) used the Sustainable Livelihood Approach (SLA) to assess livelihood vulnerability compared with five livelihood assets, namely, natural, social, financial, physical, and human capital. Hesselberg and Yaro (2006) used ecological, socio-cultural and economic political perspectives to measure vulnerability. Ribot (1995) showed that social causality and physical processes are interlinked. Dilley and Boudreau (2001) argued that the extent to which people suffer from calamities of any kind depends on how their livelihood is exposed to hazards or shocks, and on their capacity to withstand these shocks. In agreement with this view, climate change vulnerability is shown to be dynamic and dependent on both biophysical and social processes (IPCC 2014; O'Brien et al. 2007). The above discussion clearly shows that vulnerability assessment must integrate and examine interactions between humans and their physical and social surroundings (Islam, 2018).

Social vulnerability is the exposure of groups or individuals to stress as a result of social and environmental change, where stress refers to unexpected changes and disruption to livelihoods (Adger 1999). This is the degree of susceptibility of these assets to experience damage and loss due to inadequate design and construction, lack of maintenance, unsafe and precarious living conditions and lack of access to emergency services. Vulnerability is most often associated with poverty, but it can also arise when people are isolated, insecure and defenseless in the face of risk, shock or stress (Paul and Islam 2015; Islam 2018). Kelly and Adger (2000) stated that vulnerability is the ability or inability of individuals or social groups to respond or adapt to, cope with, or recover from, any external stress placed on livelihoods and well-being. Most vulnerability literature has emphasized the physical and ecological vulnerability of coastal areas. The natural hazard literature has tended to emphasize hazard assessment, and has placed less effort on estimating economic or behavioural responses (Felsenstein and Lichter 2014). A significant number of studies have focused on climate change related vulnerabilities (Kelly and Adger 2000; Cutter, Boruff, and Lynn Shirley 2003; Hesselberg and Yaro 2006; Adger 2006; Snover et al. 2007; Fussel 2007; Amos, Akpan, and Ogunjobi 2015; Bergstrand et al. 2015; Simane, Zaitchik, and Foltz 2016). Vulnerability is typically presented as a condition of three inter-related factors: exposure to impacts; sensitivity to impacts; capacity to adapt to impacts (Adger 2006; Smit and Wandel 2006; Snover et al. 2007; Simane, Zaitchik, and Foltz 2016; Reed et al. 2013; Islam 2018). A number of authors such as Cutter, Boruff, and Lynn Shirley (2003), Hahn, Riederer, and Foster (2009) and Shah et al. (2013) used economic, social and natural factor indicators to measure vulnerability.

Migration and displacement

Migration is a complex and multidimensional process that may occur for different reasons. A number of studies mention migration as a coping strategy that may reduce environmental and

socio-economic vulnerabilities (Warner 2010; Bhatta et al. 2015). McLeman and Smit (2006), and Drabo and Mbaye (2011) described migration as a possible adaptive response to risks associated with climate change. Naude´ (2008) mentioned three climate change channels that can intensify migration, namely scarcity of water and land, natural hazards, and conflicts over natural resources. A number of other studies, for example, Barnett and Adger (2007), have argued that people migrant from one community to another because of climate change related tensions and conflicts. On the other hand, McGregor (1994) clearly established the link between environmental change, migration and food insecurity. In the context of char land, a number of global studies have recognized that migration is a common phenomenon in char land areas due to the climate change and natural disasters, for example Lewis (1999), Karim and Mimura (2008), Brown and Funk (2008), Gero et al. (2010), Webb and Kench (2010), Black et al. (2011), Rankey (2011), Connell (2013), and Siddiqui (2014). The International Organization for Migration (IOM) has proposed a working definition of environmental migrants as 'persons or groups of persons who, for reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their country or abroad' (IOM, 2007).

On the other hand, 'population displacement' is also very complex concept. There is as yet no unique term to define those people who are being displaced or who migrate due to the environmental degradation of their original settlement (Mallick and Vogt, 2014). Sometimes it is unclear or undecided to define whether it is temporary or permanent, internal or international, or forced or voluntarily (Mallick and Vogt 2014). Some researchers define the 'displaced people' based on the causes of displacement (Warner 2010). Renaud et al. (2007) divided the 'environmentally displaced people' into three groups according to their relation to environmental disruption: environmental emergent migrant, environmental forced migrant', and environmental motivated migrant. The term 'climate induced displaced people' (CIDP) has been synonymies in different concepts, such as forced environmental migrant, environmentally motivated migrant, climate refugee, climate change refugee, climate induced migration, climigrant, climate change displaced people, environmentally displaced person, disaster refugee, environmental displace, eco-refugee, ecologically displaced person, and environmental refugee-to-be. Myers (2008) treats them as environmental refugees and defines as: the people who can no longer gain a secure livelihood in their homelands because of drought, soil erosion, desertification, deforestation and other environmental problems, together with associated problems of population pressures and profound poverty. Thereafter, we see that the migration process - slow or rapid, forced or motivated, temporary or permanent influences societal change (Mallick and Vogt 2014; Portesa 2010). Renaud et al. (2007) divided the 'environmentally displaced people' into three groups according
to their relation to environmental disruption: environmental emergent migrant (EEM), environmental forced migrant (EFM) and environmental motivated migrant (EMM). The term 'climate induced displaced people' (CIDP) has various synonyms, such as forced environmental migrant, environmentally motivated migrant, climate refugee, climate change refugee, climate induced migration, climigrant, climate change displaced people, environmentally displaced person (EDP), disaster refugee, eco-refugee, ecologically displaced person and environmental-refugee-to-be (ERTB) (Islam and Hasan, 2016' Islam and Shamsuddoha, 2017).

In general, people leave their homes for a complex set of reasons, and there is a 'multi-causality' even in forced migration. Although there is broad acceptance that the voluntary and forced migration is likely to increase as a consequence of climate change, it is difficult to estimate the scale (Islam and Hasan, 2015). Displacement is always triggered by sudden onset disasters, but economic and social factors like resource availability, social networks and livelihood opportunities determine whether or not migration occurs (Martin et al., 2013). The chronic, long-term issues emerging from extreme weather events also force people to migrate, especially during the post-disaster response and recovery phase when government mechanisms often fail to respond adequately to the

Livelihood choices

The concept 'livelihood choices' does not include much in the literature though the concepts such as livelihoods, sustainable livelihoods, and Sustainable Livelihoods Framework (SLF) frequently used in the literature. Livelihood choices is complex because it covers many aspects. Taking this broad perspective, livelihood approaches place 'people and their priorities to choose activities as means of living' at the centre of development efforts. Reviewing the literature, Scoones (2009) identified 'livelihoods' as a mobile and flexible term, which can be related to locales (rural or urban livelihoods), occupations (farming, pastoral or fishing livelihoods), social difference (gendered, age defined livelihoods), directions (livelihood pathways, trajectories), dynamic patterns (sustainable or resilient livelihoods) and much more. People thus make their living by combining a complex web of activities and interactions. The earlier literature on livelihood analysis is skewed towards qualitative accounts that are mostly descriptive in nature (for example, de Haan et al., 2000; Lindenberg, 2002; Smith et al., 2001; and Toufique & Turton, 2002) and often restricted to a particular resource management system. However, it is very difficult to generalize this concept. On the other hand, quantitative livelihoods analyses have tended to focus either on descriptive analysis (Ellis & Freeman, 2004; Sen, 2003) or made use of univariate limited dependent variable models (for example, single-equation Tobit, probit or logit models) (for example, Abdulai & CroleRees, 2001; Jansen, Pender, Damon, Wielimaker & Schipper, 2006; Tesfaye et al., 2011; Woldenhanna & Oskam, 2001). Recently, Hatlebakk (2012) used a multinomial logit model to determine occupational choice and/or livelihood strategies in Malawi, providing a more incisive and balanced assessment of the factors influencing livelihood choices.

The Sustainable Livelihoods Framework (SLF) is mostly dominant approach that is widely used in the development discourse. Thus the concept, which had first appeared in research literature in the 1980s, had become in the late 1990s one of a trio of principles underpinning UK development policy and the basis for a number of DFID programmes and practices (Solesbury, 2003). The Figure 2.2 shows a comprehensive SLF which details the main livelihood resources such as human, social, cultural, political, natural, physical, and financial capitals with institutional processes and organizational structure, livelihood strategies, and outcomes. A sustainable livelihood is commonly accepted as comprising:

> …the capabilities, assets (including both material and social resources) for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (DFID, 1999).

Much of the recent literature examines household and/or community livelihoods that is adapted Chambers and Conway's (1992) definition:

> A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long-term (Chambers and Conway, 1992).

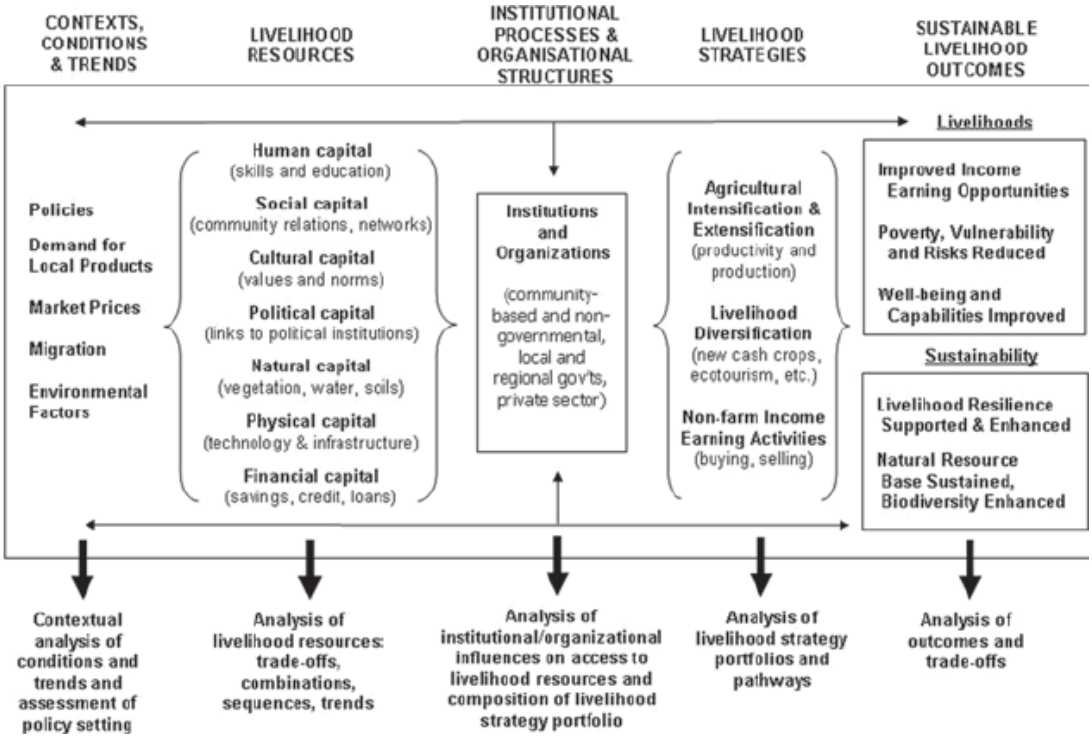


Fig. 2.2 Sustainable Livelihoods Framework, Source: Sseguya, Mazur and Masinde, 2009

Islam and Hossain (2014) used the DFID's framework to assess the livelihood patterns of the char land people in Bangladesh. The overall objective of this survey was to assess the changes happened at output and objective level by the project interventions particularly focusing livelihood situation of project target participants. The project assessed the existing livelihood assets, options and nature of shocks of the extreme poor by their wealth categories i.e. welfare households, long-term migrant and day labourer households. Though the SLF has a criticism on rural development debate, and has undergone modifications over time (Niehof, 2004). Nevertheless, it still provides for a meaningful approach to addressing sustainable development challenges (Kinsella, Wilson, de Jong, and Renting, 2000). Ellis (2000) defines a livelihood as ''the assets (natural, physical, human, financial, and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household.'' Scoones (1998) adds that a livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base. Despite its potential, the SLF has inadequacies regarding the capitals and their interactions (Baumann, 2000). The

framework presents only five and later six capitals as being vital in analyzing livelihoods—namely, natural, physical, human, financial, and social capitals. Niehof (2004) and Baumann additionally suggest cultural and political capitals, respectively, that need exclusive consideration in understanding and improving livelihoods and agro-food aspects. Thus, Flora, Flora, and Fey (2004) suggest a Community Capitals Framework (CCF) that pays attention to the seven capitals (natural, cultural, human, social, political, financial, and physical=built) and how they interact and build on one another in support of sustainable community and economic development outcomes.

Resilience

Resilience is the capacity to recover quickly from difficulties. Sometimes, it is used as synonymous to 'adaptation' where adaptation to climate change is the 'actions to reduce the vulnerability of a system (e.g. a city), a population group (e.g. a vulnerable population in a city) or an individual or household to the adverse impact of anticipated climate change' (Garschagen 2013). The concept of resilience has been used to characterize a system's ability to bounce back to a reference state after a disturbance (Pimm 1984). Other definitions emphasize the system's capacity to withstand or absorb recurrent external shocks and stresses and to maintain certain structures and functions despite disturbance (Adger, Arnell, and Tompkins 2005; Folke 2006). Walker et al. (2004) emphasize the system's capacity to reorganize while undergoing change so as to retain essentially the same function, structure, identity and feedback. Resilience relates to the societal response to and capability to recover from hazards (Wu et al. 2016). The concept of resilience is increasingly associated with the ecological theory to social systems which leads to weak engagement with normative, social and political dimensions of climate change adaptation. From a practice level different organizations followed different approaches and interventions for community resilience due to climate change. For example, Islamic Relief (2015) promotes a holistic approach to climate change and disaster resilience. It assumes a link and interdependency between all natural elements – it teaches that if humanity abuses or exhausts one element, the natural world as a whole will suffer direct consequences. With this in mind, and informed by our experience and learning,

Theoretical framework

The literature gives an overwhelming theoretical debate related to climate change and human displacement/migration related to disasters. The empirical evidence base for major consequences is very weak (Gemene 2011), and assertions are largely based on 'common sense' rather than insights from theory or evidence (Black et al. 2011). Different studies apply different methodologies, and most crucially adopt different implicit or explicit definitions of migration/displacement. To consider the objectives, we could find that one theoretical approach named the 'five drivers of migration' by Black et al. (2011) and the 'pressure and release' (PAR) model by Wisner et al. (2003) are closely related to our study findings. From a broader perspective, the 'five drivers of migration' deals with the effect of environmental change on human migration. This framework identifies five families of drivers which affect migration decisions: economic, political, social, demographic, and environmental drivers. The economic drivers include employment opportunities and income differentials between places. The demographic drivers include the size and structure of populations in source areas, together with the prevalence of diseases that affect morbidity and mortality. The social drivers include

familial or cultural expectations, the search for educational opportunities, and cultural practices over, for example, inheritance or marriage. The environmental drivers of migration are exposure to hazard and availability of ecosystem services. They mentioned that these five drivers rarely act in isolation, and the interaction of the five drivers determines the details of movement. This framework is applicable to both international and internal migration and emphasizes the role of human agency in migration decisions, in particular the linked role of family and household characteristics on the one hand, and barriers and facilitators to movement on the other in translating drivers into actions.

The PAR model is rather more closed with our study findings. Recently, Islam and Lim (2015) used this PAR model on seven Asian countries, namely China, India, Indonesia, Japan, Thailand, Taiwan, and Vietnam. It is an integrated sociological understanding of disaster development and recovery. They found that the hazard is simply viewed as a 'trigger' event, which interacts with the vulnerability of the hazard-prone areas to create disaster. These disasters are socially rooted and constructed. The authors explained the PRA model in two steps: first, vulnerability is constructed through a series of social decisions that consider access to power and resources, proximity to hazards, built environments, political decisions, and social relationships; and second, the process is filtered through cultural and other networks that ultimately determine how people perceive and respond to the events that affect them.

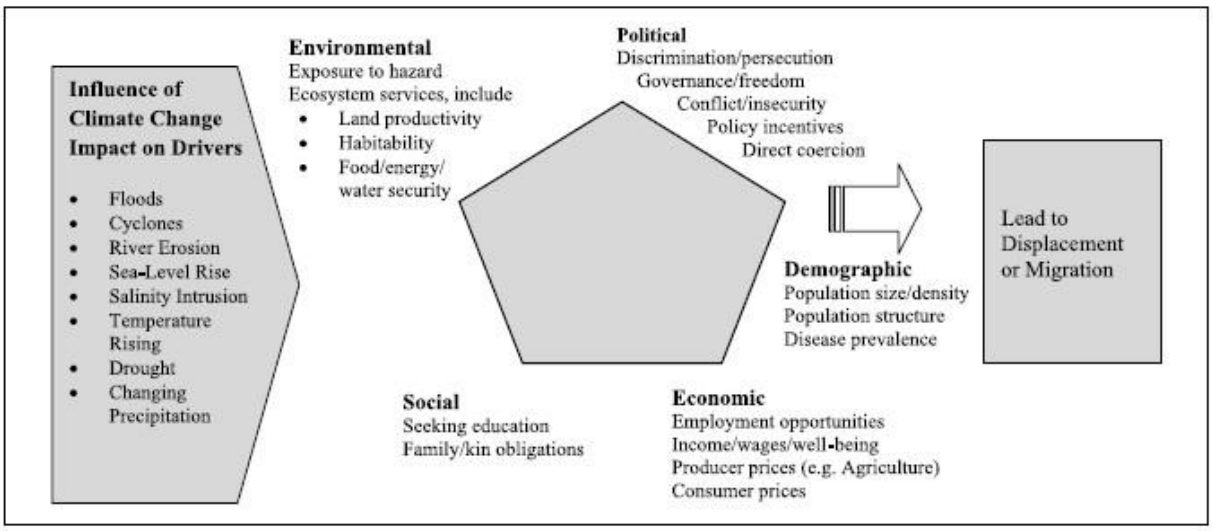


Fig 2.3 The influence of climate change on the drivers of migration. Source: Islam and Shamsuddoha (2017)

Alam et al., (2017) considered a holistic approach to assessing the livelihood vulnerability of riparian communities with regards to socio-demographic status, livelihood strategies, social networks, access to food, water and health interventions, vulnerability to the impacts of natural disasters and perceived climatic variability. Their study found the components of food, water, health and livelihood strategies to be the primary drivers increasing the vulnerability of riparian households. Rahman et al., (2016) found that river erosion, the increase of temperature and the late arrival of monsoon rain, excessive monsoon rainfall, high use of agrochemicals, and flow alterations are major drivers in the riverine ecosystem. These drivers are creating pressures on agricultural land, soil fertility, water availability and livelihood patterns of affected

communities. Hence, floating bed cultivation, integrated pest management, use of cover crops, reforestation, the introduction of an agro-weather forecasting system, and a new variety of flood tolerant species have been suggested as potential EbA to cope with river bank erosion and to increase the capacity of the affected ecosystem. Islam and Shamsuddoha (2017) developed a consequential framework of climate change including river erosion and showed its interrelations with five main drivers such as demographic, environmental, social, political, and economic that lead displacement or migration (Figure 2.3).

Perch-Nielsen et al. (2008), Islam and Hasan (2016), and Islam and Shamsuddoha (2016) presented a series of case studies which showed that migration is associated with sea level rise and river and coastal flooding. They outlined a conceptual model of migration decision-making in the face of natural hazards, disasters and social vulnerabilities. On the other hand, Penning-Rowsell et al. (2013) showed that 'push' and 'pull' factors affected hazard-related migration. They mentioned that the vulnerability of the rural population to hazards may be increasing due to their reduced savings. Islam and Herbeck (2013) found that in coastal areas, the livelihoods of fishing families is associated with endemic poverty and a series of vulnerabilities, both of which and contributed to migration decisions. From the above analysis, it can be concluded that most of these studies considered the issue or migration issue with physical instability such as housing and settlement, and agricultural damages such as flood and erosion, but very few have comprehensively examined climate change and natural disasters with the economic and social livelihood vulnerabilities that force the char land people in Bangladesh into migration decisions (Islam, 2018).

Islam, Hossain and Murshed (2015) developed a coastal vulnerability index (CVI) using eight parameters namely (a) geomorphology, (b) slope, (c) relative sea level change rate, (d) mean tide range (e) shoreline erosion and accretion, (f) population (g) bathymetry and (h) coastal flooding which were addressed as the relative risk variable for the study area using geospatial techniques i.e., Remote Sensing and GIS. On the other hand, Rahman et al., (206) used a comprehensive approach to the Vulnerability and Impact Assessment (VIA) of river erosion and to suggest Ecosystem-based Adaptation (EbA) practices. Based on the analysis of vulnerability using the Driver-Pressure-State-Impact-Response (DPSIR) framework, this paper discusses some of the significant climatic (rainfall pattern, temperature, seasonal drift, cold wave and heat wave) and non-climatic (river erosion, repetitive death of field crops and agrochemicals) forces in the Kazipur Upazila (Sirajganj District)—a river erosion-prone area of Bangladesh. Alam et al., (2017) used the IPCC framework, developed a holistic approach to assess the livelihood vulnerability of 380 resource-poor, rural riparian households from char and river-bank communities in Bangladesh. The Livelihood Vulnerability Index (LVI) to measure the socioeconomic perspective of the main drivers of vulnerability were found to be livelihood strategies and access to food, water and health facilities. Riparian households were also found to be vulnerable due to their relative inaccessibility and low livelihood status which coupled with climate impacts on river morphology drive erosion and loss of land with consequent decrease in economic potential, and thus creates a vicious cycle of poverty.

Research on vulnerability, social dignity and livelihood choices by river erosion

There is an over whelming literature that showed the relationships and impacts of river erosion on vulnerability, social dignity and livelihood choices globally as well as in Bangladesh.

Morton et al. (2008) note that climate change induced extreme weather events, primarily hydro-meteorological in nature, significantly affect displacement in three different ways in Bangladesh. First, the effects of warming and drying in some regions reduce agricultural potential and undermine 'ecosystem services' such as the availability of clean water and fertile soil. Second, heavy precipitation causes flash or river floods in tropical regions. And finally, the sea-level rise permanently destroys extensive and highly productive low-lying coastal areas that are home to millions of people who have to relocate permanently. Activities that harness and manipulate the flow of water for the benefit of humans have increased dramatically with the increase in global population (Wellmeyer et al., 2005), with a range of consequences including channel pattern alteration, increased flood risk, navigation constraints and changes to aquatic and riparian ecosystems (Li et al., 2007).

River bank erosion and inundation are the common forms of geomorphic hazards associated with floodplain and meandering or braided river systems (Lawler 2004; Bandyopadyay 2007). Bank erosion is triggered by various factors, viz. flow characteristics, bank material composition, climate, vegetation, subsurface conditions and anthropogenic agencies (Knighton 1998) and Bandyopadhyay (2007). Rivers are highly sensitive to environmental conditions (Eaton et al., 2010; Rozo et al., 2014), and alluvial channels can respond or readjust at a range of rates to the variations caused by water and sediment inputs, active tectonics and human activities at a range of spatial and temporal scales (Sinha and Ghosh, 2012; Heitmuller, 2014). Any changes, whether natural or anthropogenic, can initiate a departure from a state of dynamic equilibrium (Winterbottom, 2000; Petts and Gurnell, 2005). This may, in turn, result in channel instability causing changes in channel form and pattern (Yang et al., 1999; Surian and Rinaldi, 2003; Wellmeyer et al., 2005; Richard et al., 2005; Li et al., 2007; Kummu et al., 2008; Yao et al., 2011; Ramos and Garcia, 2012; Gupta et al., 2013; Midha and Mathur, 2014). The stability of river banks is primarily dependent on the behavior of river beds during rising and falling flood stages. The extent and nature of bank erosion or mass failure depends upon the net force exerted by flood water on the bank material and the resistance of the bank material (Knighton, 1984; Morisawa and Hack, 1985) and direct fluid entrainment (BWDB, 2007; Basar, baki and Gan, 2012).

A review of the literature suggests that the dynamics of population movement, whether climate related or not, are complex and diverse. Such movements include internal displacement and international cross-border movement, and may be permanent, short-term, seasonal or circular in nature. In Bangladesh, it is seen that people in a good financial condition (e.g. cash capital) and with resources (e.g. land and good housing facilities) migrate in a planned way, while those who are poorer, especially women, children, the elderly and disabled people, have fewer options for either planned or forced migration (Islam and Shamsuddoha, 2017; Islam, 2018). Mallick and Vogt (2014) note that the total migration process has direct socioeconomic and cultural impacts on society at both the origin and destination of the displaced peoples. Planning systems in developing countries like Bangladesh have found it difficult to accommodate climate change related migration and uncontrolled urbanization (Ahsan et al., 2011). The people affected often remain stuck in vulnerable locations. Displaced and stuck people face persistent insecurity in terms of basic needs such as food, water and sanitation. They either starve or struggle with further natural disaster risks and degraded environmental conditions. Women are the primary victims of disaster events and also bear more of the burdens of ensuing

food and water crises. For short- to medium-term migration, people usually move to adjacent chars (river islands) or embankments, especially when basic services are no longer available (Paul and Islam, 2015). In the case of long distance routine economic migration, people usually settle in large urban slums, or other 'urban poverty pockets', which lack basic services (UN Habitat, 2015).

A number of literature, notably Adger (2010), and Islam and Shamsuddoha (2017) argued that climate change leads to slow-onset changes in climatic and environmental conditions (e.g. sea-level rise, land degradation and loss, declining abundance of fish, contamination of water resources and degradation of coral) that contribute to loss of important environmental amenity and livelihoods. Slow-onset environmental changes can be a proximate factor in long-term movement away from a place of origin. Forced displacement is likely to occur as environmental changes and extreme climate events undermine peoples' ability to live in their places of residence (Islam and Khan, 2018). Islam, Malak and Islam (2013) carried a study on a multi-hazards risk and vulnerability assessment for the coastal Matlab municipality in Bangladesh and to recommend possible mitigation measures. Islam (2018) found that climate change and natural disasters related vulnerabilities are important factors for migration decisions for poor people in vulnerable locations such as char land areas. Islam and Guchhai (2015) showed relation between controlled hydrology and socio-economic vulnerability of the impact assessment area. They mentioned that bank erosion induces socio-economic instabilities from various aspects. This basic notion has been explored by the various scholars worldwide from the basic stand point of population displacement and migration, agriculture and general economic declination, deteriorating conditions of the women, property loss and damage, and other social instabilities. Population displacement is the foremost consequence of the bank erosion. Basar, Baki and Gan (2012) reported that as one of the largest braided rivers in the world, the Jamuna River (JM) of the lower Brahmaputra regularly undergoes significant erosion, causing major bank line migration, making thousands of families homeless and sizeable land loss every year, e.g., the dynamic nature of Jamuna causes great suffering to the people living along its course and on its islands.

Agriculture is badly impacted by the bank erosion (Schmuck-Widmann 2001; Uddin and Rahman 2011). Generally, it has been noted that bank erosion induces change in cropping pattern, decline of production, change in crop diversity, change in cropping intensity and damage of crops (Uddin and Rahman 2011). In Bangladesh, it has been noted that due to sand deposition rice growing is not possible and in place of rice, maize, pulses, oil seeds, ground nut, etc. are being cultivated on the char (Uddin and Rahman 2011).There is also the problem of in situ displacement of peasant holdings. Declining agricultural productivity scenario (Baboule et al. 1994; Roose 1996; Dragicevic and Stepic 2006) has led to decline of agricultural population. Not only the agricultural decline but also the general decline of the economy is noticeable in the erosion-prone area. Poverty, unemployment, job shifting and indebtedness are common scenarios in this belt of erosion (Uddin and Rahman 2011). Bank erosion severely impacts on the vulnerable groups of the society and especially women (Rogge and Elahi 1989; Haque 1997). It has been noted that displaced women have higher level of perceived stress than the non-displaced counterpart (Taylor et al. 1976; Logue
et al. 1979; Shore et al. 1986; Canino et al. 1990; Lima et al. 1991; Keya and Harun 2007). Bank erosion also affects property belongings. When disaster strikes, poor people survive by

the selling off their belongings such as land, livestock, housing materials and other personal belongings (Haque 1997; Hutton and Haque 2004; Uddin and Rahman 2011). Besides these socio-economic impacts, some other social vulnerabilities found in erosion-prone area are broken social bondage, broken family relation, disruption of social services, degradations of social status, ruin of peace and increase in social injustice of the poor by the powerful and the rich group (Islam and Rashid 2011).

CHAPTER 3
METHODOLOGY OF THE STUDY

Research context and location

The study was conducted on three unions such as Chandpur Union in Tazamuddin Upazila, Pakshia in Burhanuddin, and Bhabanipur in Daulatkhan of the Bhola District in Bangladesh (Figures 3.1, 3.2, 3.3 and 3.4).

Fig. 3.1 Map of Bhola District

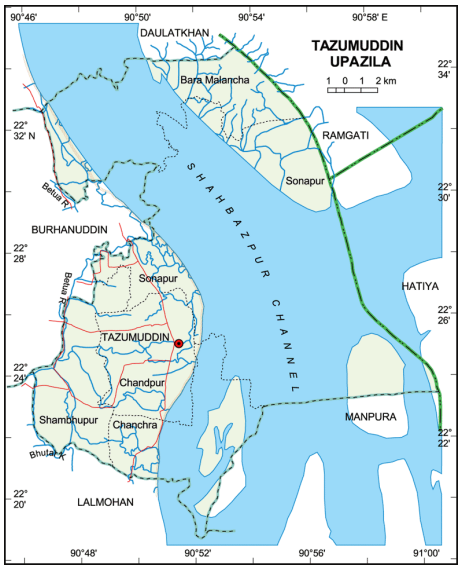


Fig. 3.2 Map of Tazimuddin Upazila

Fig. 3.3 Map of Burhanuddin Upazila

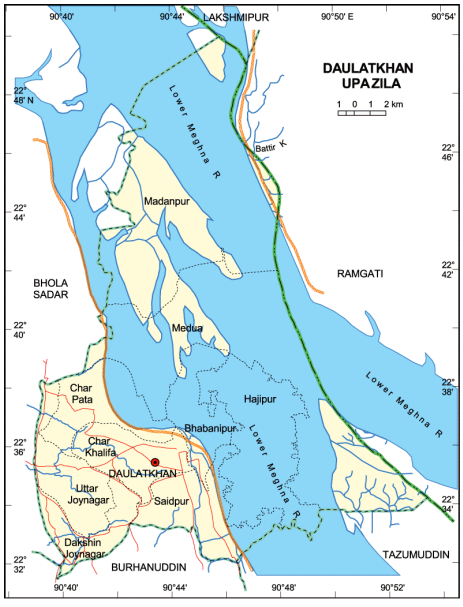


Fig. 3.4 Map of Daulatkhan Upazila

Research approach

This study used a mixed method approach where both qualitative and quantitative were employed. A number of authors such as Islam and Hossain (2014), Islam and Walkerden (2015), Paul and Islam (2015, 2018), and Islam and Hasan (2016) used a mixed method approach for similar studies. The fundamental rationale behind a mixed methodology was to combine the strengths of qualitative and quantitative methods. The overall purpose and central premise of mixed methods is that combining methods would provide a better understanding of complex phenomena than either approach used alone (Azorin and Cameron 2010; Islam, 2018). In addition, within a mixed method approach there was an opportunity for the researcher to verify this investigation from different ontological and epistemological points of view (Paul and Islam 2015; Islam and Hasan 2016). For successful completion of the study, two sources of data - primary and secondary were used in this study. The main source of primary data were collected from different levels and stakeholders including households, community leaders, relevant NGOs/INGOs, and representatives of the local governance.

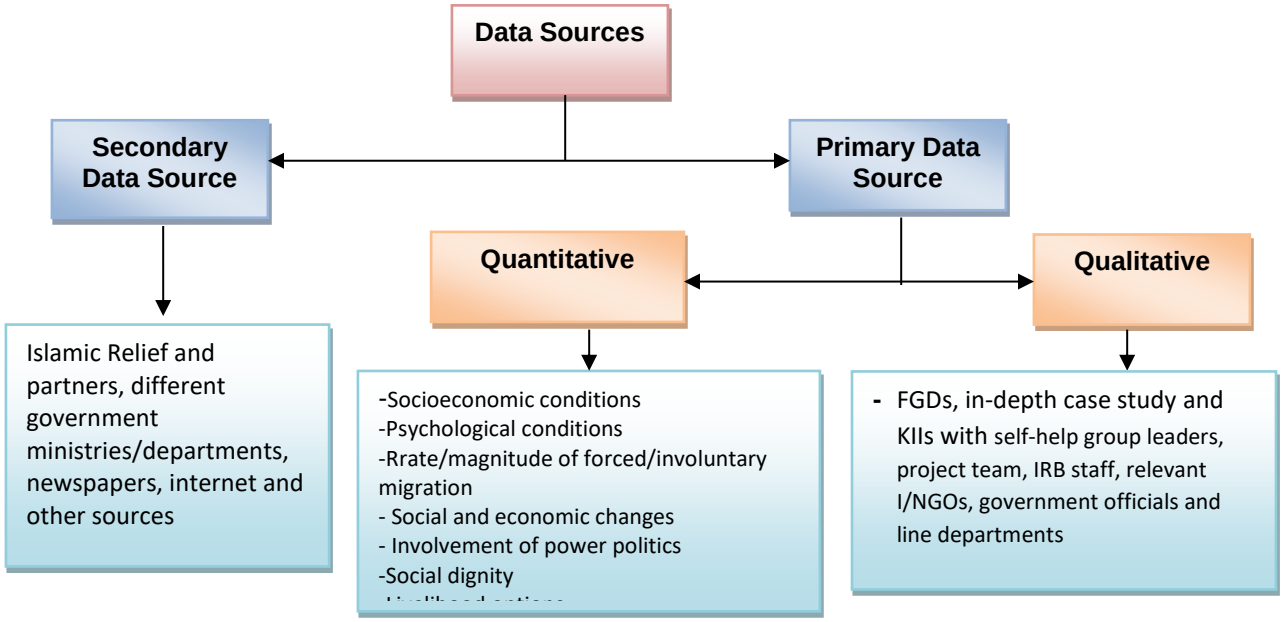


Fig. 3.5: Data source

Research method

This study used a survey method for quantitative data and a case study method for qualitative data. The survey method was used because the study attempted to get representative data from wider Bhola District where a month time was allocated for data collection. Many aspects of this study within the range of study objectives such as demographic and socio economic characteristics, asset mapping (e.g., income, expenditure, land and other capitals), food security, information related river erosion and migration and displacement, vulnerability, social dignity, coping strategies and resilience, etc. which were more appropriate to use this survey method. On the other hand, the case study method was useful to collect in-depth data on the sufferings and livelihood aspects of the affected people, particularly how this erosion effects on the livelihoods on different kind of people such as women, children, disabled people, and pregnant women and how this regressed their social dignity and vulnerability and finally how different people used different types of coping strategies and resilience in the community.

A qualitative case study is the only research method which has different data collection techniques to capture all of these diversity and multiplicity of data.

Data collection methods and data collection instruments

For quantitative data collection, a structured interview schedule was used with numerical value. Separate set of guideline was employed for qualitative data such as FGDs, in-depth case study, and KIIs. The qualitative data collection instruments were used to collect the qualitative information such as livelihoods sufferings, impacts of river erosion on their lives and livelihoods, socioeconomic diversity and livelihood choices, social dignity, sociocultural and political influence and so on.

Tentative list of indicators

Table: 3.1 Major components against the list of indicators

List of indicators	Major components
Socio-economic	Demographic, literacy and educational attainments, occupational status, living conditions, access to safe water, sanitation and energy/fuel, productive and livelihood assets, non-productive assets, income and its sources, and sources of expenditures.
Mental/psychological conditions	Mental stress, depression, anxiety, isolation, association, social distance, group formation, social insecurity, self-harm, communication skills, adjustment, adaptation, coping strategies, and community resilience.
Rate/magnitude of forced/involuntary migration	Rate of forced/involuntary migration, causes of migration, and social and cultural environment
Specific social and economic changes	Social networking, neighbourhood, social capital, cultural bondage, relatives, loss of economical assets, occupation
Factors of involvement of power politics	Change of motivation, conflicts of interest, involvement of politics, membership of political party, and loose of commitment
Social dignity	Sense of dignity, moral status, decision making capacity, participation, social justice, social responsibility, humanity and kindness, holiness and piousness, and involvement and membership of moral agent
Livelihood options of river erosion victims	Displacement, source of income, occupation, food habits, usage of capitals, and social dignity

Sample: Selection of respondents for quantitative data

This study used a multi-stage sampling procedure for quantitative data. The study was conducted on three unions such as Chandpur Union in Tazamuddin Upazila, Pakshia in Burhanuddin, and Bhabanipur in Daulatkhan of the Bhola District in Bangladesh based on the high frequency of river erosion and located in the river sides where the possibility of river erosion is higher than other Unions. According to the Population and Household Census 2011, the total number of households in those three Upazillas are 22,716. The numbers of households below poverty line are 9,056 (around 40% of the households are under poverty according to the World Bank, 2017). However, by using the sample method of Krejcie and Morgan (1970),

the total number of selected households were 371. The distribution of the sampled sized households has been provided in the Table 3.2. This is also noted that we have assumed that most of these people have river bank erosion experience and vulnerability.

Table: 3.2 Distribution of population and sample size

Upazila name	Union name	Total population (2011 Census)	Total households (2011)	Households below poverty line (40%)	Total sampled size
Tajumuddin	Chandpur	42,807	9,280	3,712	137
Burhanudin	Pakshia	23,681	5,088	2,035	145
Daulat Khan	Bhabanipur	5,900	1,209	483	89
Total		72,388	15,577	6,230	**371**

$$n = \frac{N}{1 + Nd^2}$$

n = required sample size

N = Population Size

d = margin of error (ideal value is 0.05) at 95% confidence level (Krejcie and Morgan, 1970).

Table: 3.3 Qualitative data: Data collection instruments and respondents

Data collection instruments	**Upazila**	**Union**	**Respondents**	**Total respondents**
In-depth case study	Tajumuddin	Chandpur	Aged male=1 Aged female=1 Parents=1 Disabled= 1	4
	Burhanuddin	Pakshia	Aged male=1 Aged female=1 Parents=1 Disabled= 1	4
	Daulatkhan	Bhabanipur	Aged male=1 Aged female=1 Parents=1 Disabled= 1	4
FGDs	Tajumuddin	Chandpur	Community leaders and members of civil society	1
	Burhanuddin	Pakshia	Community leaders and members of civil society	1
	Daulat Khan	Bhabanipur	Community leaders and members of civil society	1
KIIs	Tajumuddin	Chandpur	UNO=1, UzDMC= 2, UP chairman=1, NGO worker=1	5
	Burhanuddin	Pakshia	UNO=1, UzDMC= 2, UP chairman=1, NGO worker=1	5
	Daulat Khan	Bhabanipur	UNO=1, UzDMC= 2, UP chairman=1, NGO worker=1	5
Total				**30**

Respondents' profile:

The demographic data (Table 3.4) from the selected respondents showed that most of the household heads (88%) were male. From age distribution, the highest numbers were found 26% in the age group 31-40 years, followed by 21.9% age group 41-50 years and 20% age 51-60. A very few number (2.1%) were found among under 20 years. Married household heads were 5$% and unmarried 39% (Fig. 3.6). Among the family members only 2.65% were found disability. From the occupational status, it is found that the highest 36% are fishing, followed by 22% of them were found day labourer and 10% housewife. A very small number (1%) were unemployed. Among the household head, the highest 51% cannot sign, 21% primary education, 14% can only sign, 11% secondary school and only 6% have postgraduate degree (Fig. 3.7).

Table 3.4: Socio-demographic information of the respondents

Socio-demographic information	%
Household head of the family	
Male	87.6
Female	12.4
Age of household head	
>20 Years	2.1
21-30	13.5
31-40	26.0
41-50	21.9
51-60	20.0
61+	16.5
Disability in the family	
Physically challenged	1.33
Blind	0.66
Lame	0.46
Deaf and dumb	0.20
Main occupation	
Day labourer	21.8
Agriculture	6.5
Fishing	36.1
Grocery shop	4.3
Rickshaw or Auto pulling	3.3
Tailoring	0.5
Government job	3.5
Small business	1.1
Garment workers	0.5
Housewife	10.0
Unemployed	1.1
Not applicable	4.6
Others	6.7

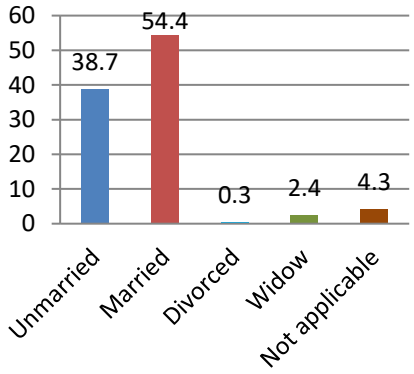


Fig. 3.6 Marital status of HHs

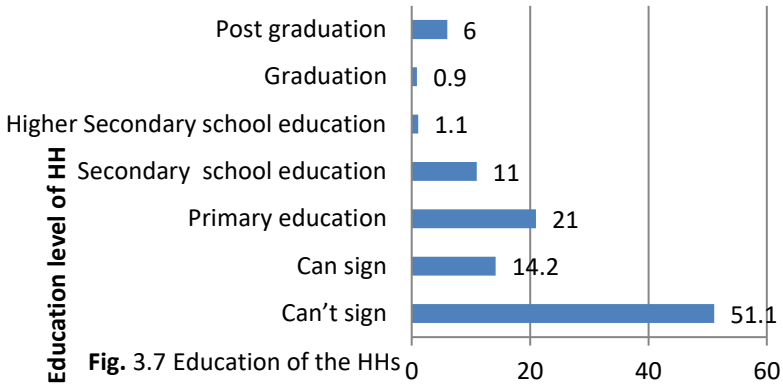


Fig. 3.7 Education of the HHs

Study management and quality control

- ***Quality Control***

The Team Leader leaded the study and conducted training for capacity building of the study team including the field level enumerators. One Research Associate in each upazila (total three) monitored and supervised the filed level data collectors throughout the data collection period. They edited and checked immediately at field level. The Team Leader supervised the overall activities of the field staff and verified the consistency of the collected data and compared it with the secondary data. These measures were found very effective to maintain the quality of data.

- ***Field Editing of Questionnaire***

Editing is the checking of filled-in questionnaire for detecting any error or inconsistency, if any. There were two types of such editing: field edit and office edit. Field edit was done by the enumerator administering the questionnaire. Verification of information and office edit was conducted by Team Leader. Each and every filled in questionnaire was checked for error and inconsistency in the office. For serious error if detected, the questionnaire was re-administered.

- ***Quality Control in Data Management***

The primarily collected data were analyzed through computerized programme. Some of the indicators were also adopted for ensuing quality outputs of the baseline information. The following are the stages in computerization and processing of the collected data:

-Five (5%) percent of the filled–in questionnaires were checked against entered data to measure the error level in entry

-Checking of data by sorting those in ascending or descending order

The study adopted the standard procedure in preparing and analyzing the database. The collected data were entered in the computer by using the customized MS Access data input software. SPSS for Windows and MS Excel will be used to analyze the data.

- ***Data processing and analysis***

Data were edited and cleaned by checking and rechecking for omissions, inconsistencies and improbabilities missing values and values out of range. All completed questionnaires were kept ready for data entry. The answer from the fully completed questionnaire were entered according to appropriate coding. Data entry was conducted using a standard data entry

package. Both digitalized data (soft copies) and hard copies of completed questionnaires were kept securely. Data were entered according to the identification number.

Analysis was started as soon as data were entered. Data analysis was planned according to the objective of the study with an aim to get the answer of research question and list of issues to be addressed as proposed in the terms of reference. Data analysis was involved transforming data with the aim of extracting useful information and facilitating conclusions. Outputs from SPSS was organized into Excel spreadsheets. To ensure correct results, the analysis was crosschecked to discover possible errors and inconsistencies. The outcome of the analysis was closely monitored and discussed. A first draft including tables, figures, and literature were shared with Islamic Relief before preparing the final draft.

- ***Triangulation***

The main important issue will be to triangulate the collected information from different sources for its correctness and synchronization. The triangulation process is given in the figure 3.8:

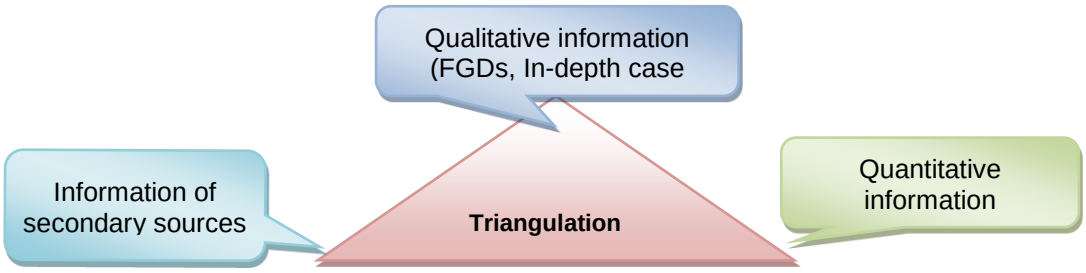


Fig. 3.8 Triangulation process

Triangulation process was validated the relevancies of the collected data in different manner.

Research ethics

The study team took permission from the Upazila Nirbahi Officer (UNO) from all three upazillas. In this regard, separate written letter was sent to them by post and e-mail. The enumerators hold such kind of letter during their data collection. A verbal consent was taken by the enumerators from the heads of the households before starting interview with them. The enumerators also explained the research objective and possible benefits of the study to the respondents. All Research Associates contacted with the Chairman of the Union Parishad (UP), community leaders and individual cases and took their consent and cooperation during conducting FGDs, KIIs and in-depth case studies.

Limitations of the study

• In some cases, the location was very remote areas where road communication was debauched
• Lack of scientific data about the number of low income people in three upazilas
• Lack of previous studies on same areas on Bhola District particularly on selected three upazillas.

CHAPTER 4
FIELD FINDINGS/RESULTS

Economic profile of the households

Income, asset, expenditure and saving

The monthly average household income was found Tk. 13,803, which showed much lower than the national rural income (Tk. 18,349 in 2016). The highest 29% households' income was Tk. 10,001 – 15,000, followed by 14% (each) Tk. 15,001 to 20,000 and Tk. 20,001 – 30,000 respectively, 12% of the households income was Tk. 4,001 – 7,000 and the lowest 5% Tk. 1,000 – 4,000; and below 1% income was Tk. 40,000 and above (Figure 4.1).

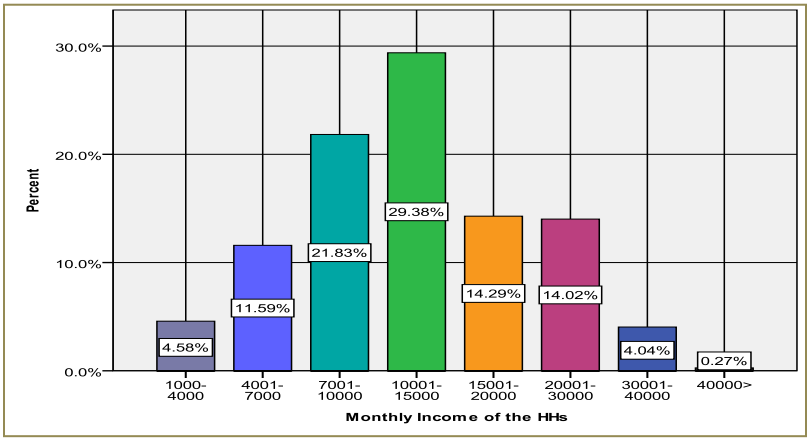


Fig. 4.1 Upazilla wise month income of the household

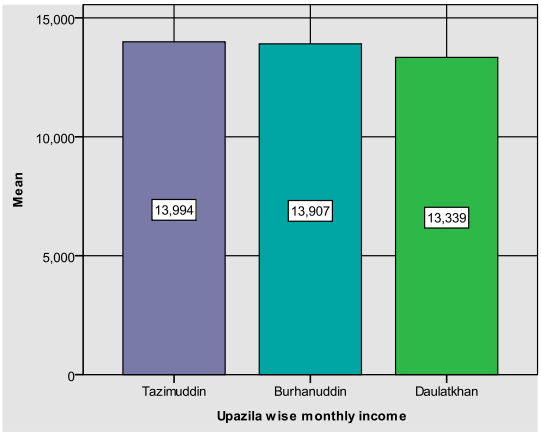


Fig. 4.2 Monthly income of the household

Table: 4.1 List of asset and average value of the household

List of Asset	Average value (in Taka)
Cash capital	18,346
Invested resources	16,609
Land	81,811
Ornaments (Gold/Silver)	1,41,147
Livestock (mention type of livestock separates in the next column) Cow/ Goat/ Pigeon/ Chicken/ Duck/ Buffalo	15,104
House property	36,309
Boat	16,811
Vehicle	11,302
Trees	4,701
Fishing net	8,752
Shop	6,770
Others	9,940
Total	**2,40,972**

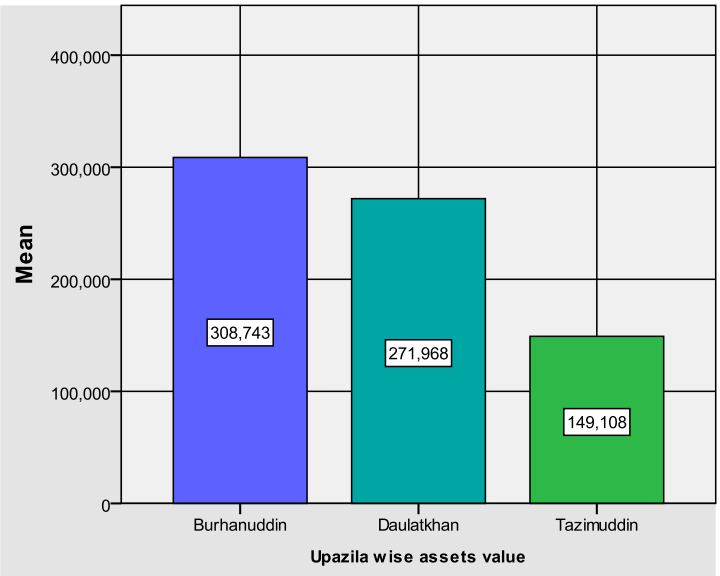


Fig. 4.3 Upazilla wise asset value (in Taka)

From the asset mapping, it found that the households did not have sources for their livelihoods:

One Research Associate from the Bhabanipur Union in the Daulatkhan Upazila recorded:

> I find only one family who is involved in crop cultivation in the main land of the Bhabanipur Union though the char people have this cultivation. None of the families has cattle, only few have goats, and some have only ducks. The local people report to me that they cannot do chicken rearing as they do not have place to keep them safely. In addition, the chickens die because of extreme weather. In many cases, I discover that there are some income opportunities, but they do not do that as they are much habituated to do their own work e.g., fishing as they have skills. The local people report me that if some families do cultivation, they hire the people from outside to do this. It is remarkable that they earn a lot of money from fishing in four months' season time, but they spend all of their income within this time, and they take loan from the NGOs (Coast, Grameen Bank, ASA, and Akti Bari Akti Khamar (EBEK) for the rest of the months. In most of the cases, they can pay loan to the EBEK, but they further take loan from other sources to pay other NGOs' loan.

One Research Associate from the Chandpur Union in the Tazimuddin Upazila noted:

> Among 31 families, I have found hardly 3 to 5 families have chicken and duck. I found only one family in this union who has only one cow. There are no pigeons, goats, sheep, and buffalos in their houses. People cannot live on livestock rearing. Once upon a time, people have motivations to rear the livestock, but they cannot do this because of the shortages of finance and safe places.

Another story from Chandpur Union:

> The people have no cash capital, savings, ornaments, and cultivable land. They have bought khash land from the powerful persons. If government impose any declaration to leave the land, people have to shift this land to Government immediately. Most of the families have no documents against their land. They are mainly dependent on river. They can catch fish 6 to 8 months including four seasonal months over the year. The rest of the year, they have to depend on loans such as from the Banks, NGO's, moneylenders or relatives. I found no single man who gives or receives zakat and fitra. Most of the people do not sacrifice animals during Eid Ul Udha. They spend less money during festivals like Eid Ul Fitr, Pohela Boishak. They have no Nobanno Utsob.

The monthly average household expenditure revealed Tk. 15,911, which was bit lower than their income (Tk. 13,803). Only 34% of the households could save and the annual saving amount per household was Tk. 18,870 (Figure 4.5); 80% of the households had to pay loan, and its average annual amount was Tk. 1,14,621 (Table 4.2). From upazial wise statistics, it found that the people of Daulatkhan spent highest amount of money (Tk. 20,312), followed by Burhanuddin Tk. 15,417 and the lowest Tazimuddin Tk. 13,574 (Figure 4.4). On the other hand, the saving was found highest Tk. 30,613 in Burhanuddin, followed by Tk. 15,092 in Daulatkhan and the lowest average saving Tk. 8,897 in Tazimuddin (Figure 4.5). The households used the highest of their income for purchasing food (Tk. 7,207), followed by Tk. 2,711 for loan payment, Tk. 2,553 for own recurrent capital like raw materials. They also spent Tk. 1,237 for dowry and Tk. 1,040 for festival. Their spending on health and education was found very low as they spent only Tk. 967 for health services and Tk. 835 for education.

Table: 4.2 Monthly expenditure of household

Type of monthly expenditure	**Average value (BDT)**	
Spending for own recurrent capital like raw materials for business /agricultural inputs/ pesticide/ etc.	2,553	
Food	7,217	
House (repair, construction, rent)	2,043	
Education	835	
Health services	967	
Purchasing Clothing	9,10	
Electricity/gas/water	275	
Entertainment/ Recreation	234	
Transport	515	
Loan repayment	2,711	
Festivals	1,040	
Dowry	1,237	
Mobile	346	
Other	576	
Total average	**15,911**	
Saving and loan last one year		
Responses	**Yes**	**No**
% of HH have saving	34%	66%
Average saving value	Tk. 18,870	
% of HH have loan	80%	20%
Average loan value	Tk. 1,14,621	

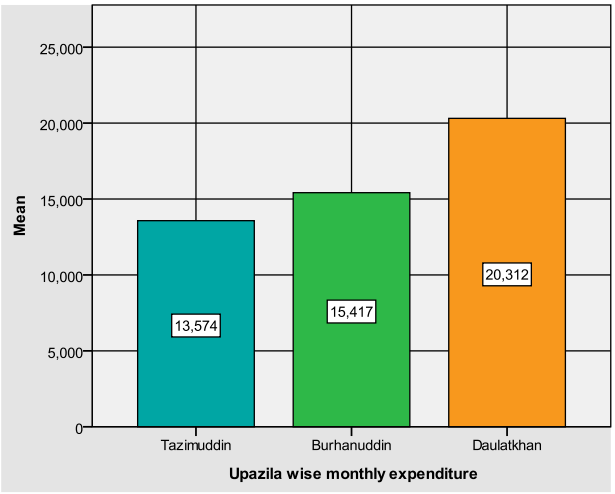


Fig. 4.4 Upazilla wise monthly income

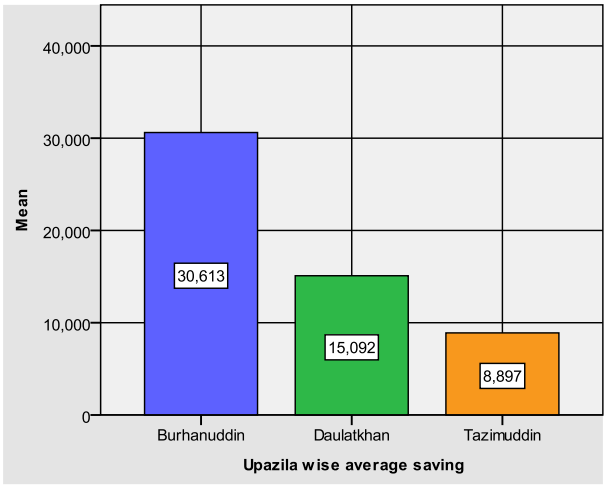


Fig. 4.5 Upazilla wise monthly saving

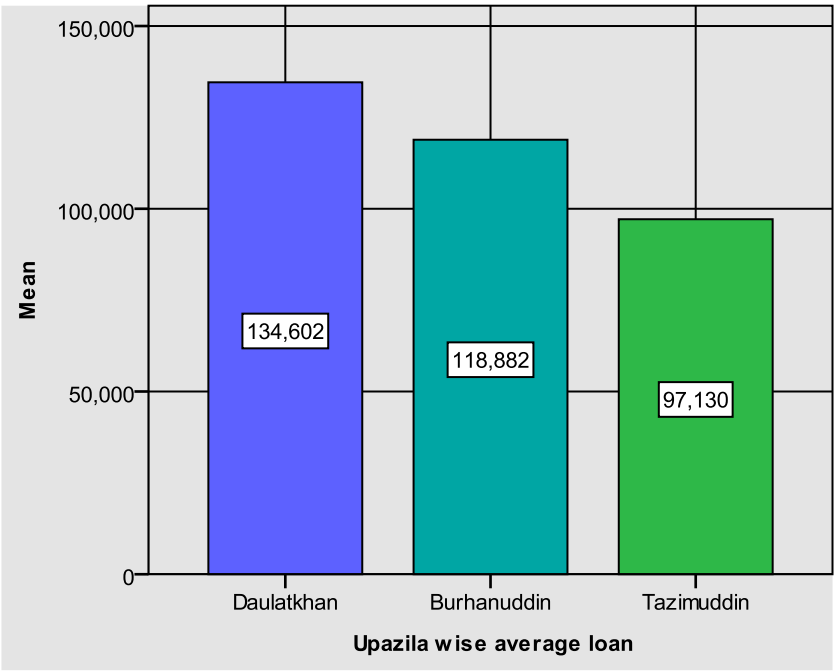


Fig. 4.6 Upazilla wise annual average loan of the household

Access to landing

In land access, it found that the land access among the households of the Burhanuddin Upazila was the lowest, where 39% of the households had no access to land, followed by 28% in Daultkhan and 23% in Tazimuddin. Among them who had land access (Figure 4.7), 88% to 94% had only home stead land in three upazillas (Figure 4.8). From type of lease land, Burhanuddin had 56% cultivable land which was found only 13% in Daulatkhan and no cultivable land was found in Tazimuddin (Figure 4.9). Data showed (Figure 4.10) that their home stead land susceptibility was found very high, where 79% to 93% (in three upazillas) of their home stead land showed susceptibility to disaster though their cultivable and uncultivable land susceptibility to disaster were low (Figures 4.11 and 4.12).

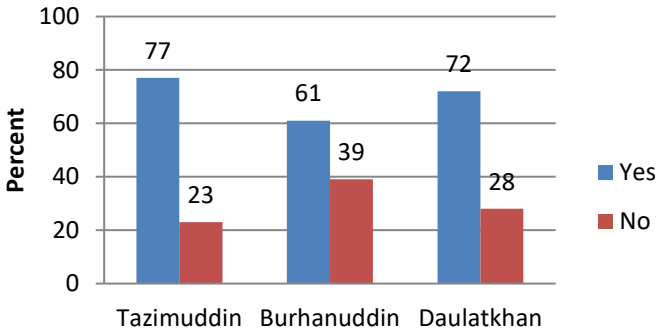


Fig. 4.7 Possess land

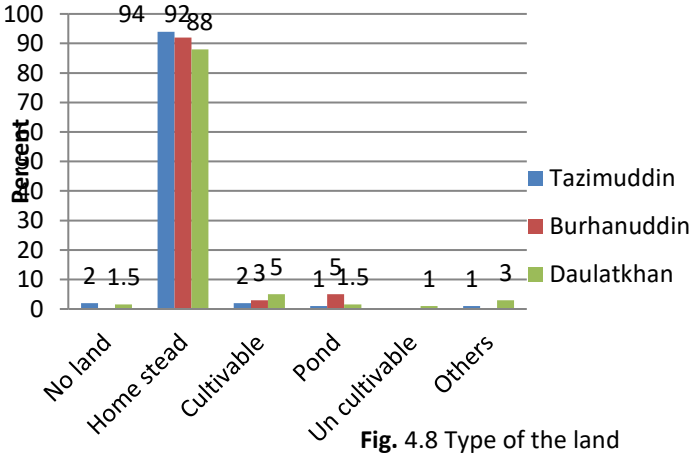


Fig. 4.8 Type of the land

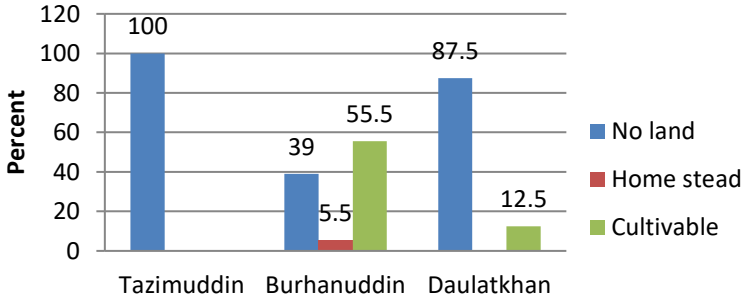
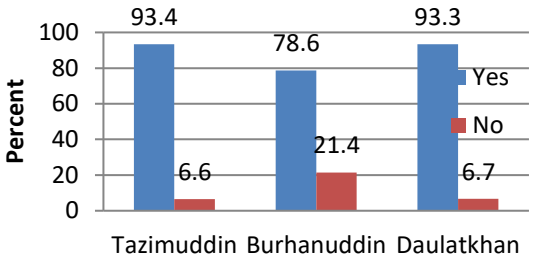


Fig. 4.9 Type of the lease land

Fig. 4.10 Homestead land susceptibility to…



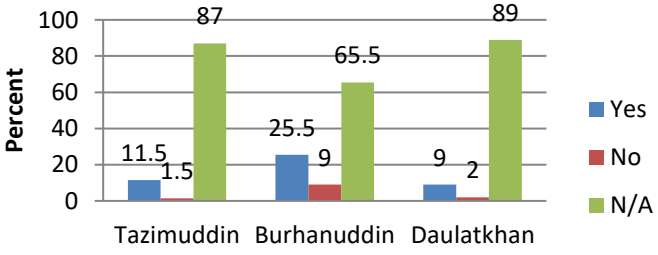


Fig. 4.11 Cultivable land susceptibility to disaster

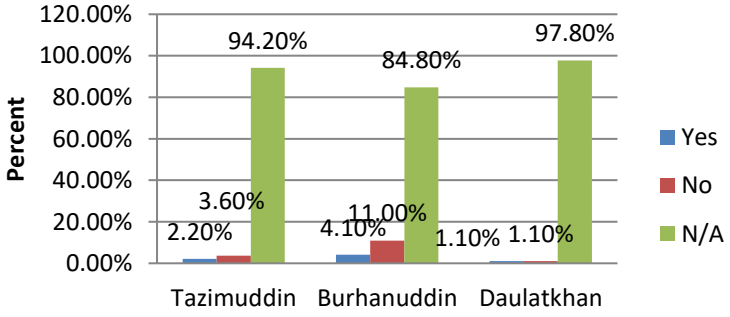


Fig. 4.12 Uncultivable land susceptibility to disaster

Housing, latrine and sanitation practices and water sources

Housing and latrine facilities

From the ownership of household, it found that 77% to 96% of the river erosion affected households in three upazillas had self-ownership of their house, 91% to 96 of their houses were made by tin, wood and bamboo (Figure 4.14), and 80% to 90% made their houses by their own earning (Figure 4.15). Most of them described their housing condition was fair and bad followed by moderate in all three upazillas. A very small number of people told that their housing condition was good and excellent (Figure 4.16). It is mostly remarkable that a high number of people described that their houses were suffered significant and minor damage risk. The highest 59% houses in Burhanuddin, 56% in Tazimuddin and 39% in Daulatkhan had

significant damage risks (Figure 4.17), which were 22%, 29% and 43% minor damaged risk respectively of those three upazillas (Figure 4.18).

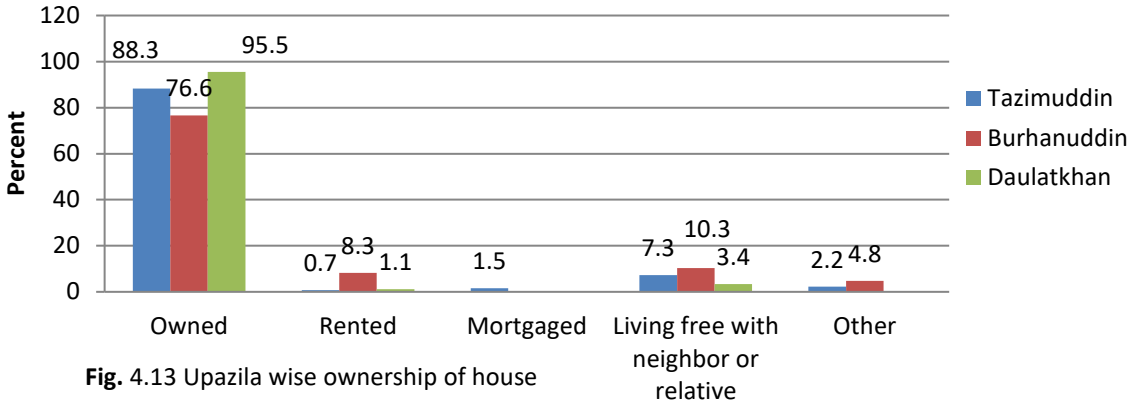


Fig. 4.13 Upazila wise ownership of house

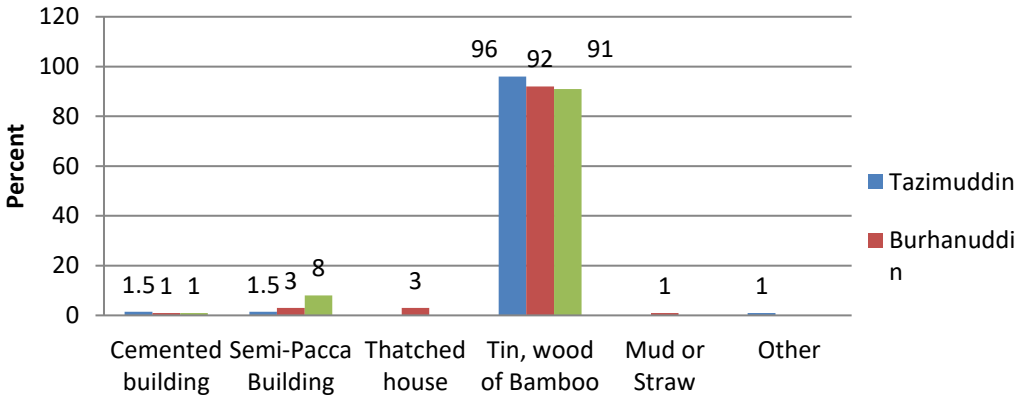


Fig. 4.14 Upzila wise type of households

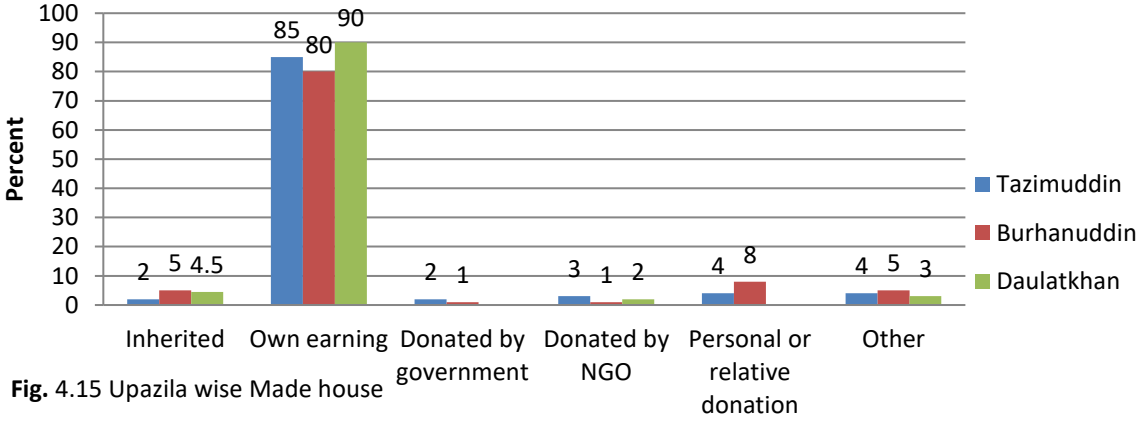


Fig. 4.15 Upazila wise Made house

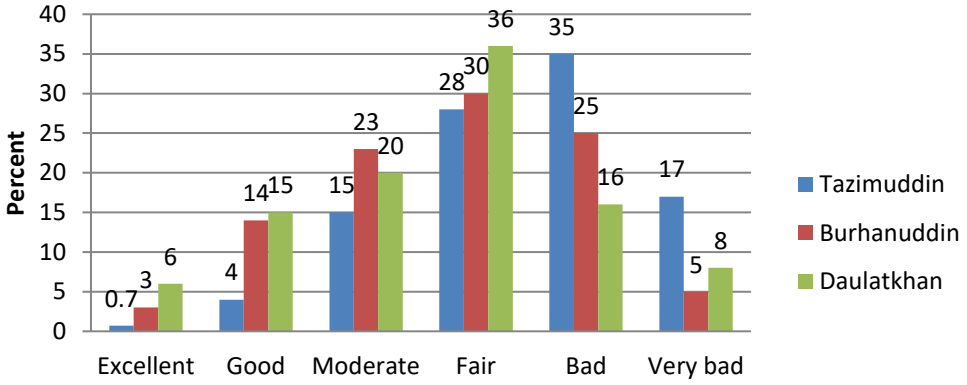


Fig. 4.16 Housing condition

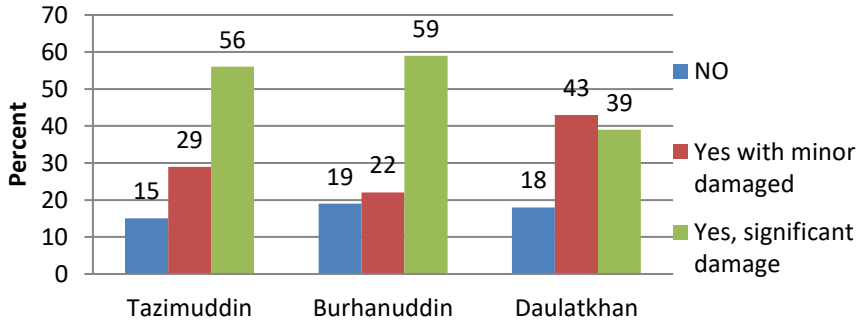


Fig. 4.17 Upazila wise home suffered any damaged

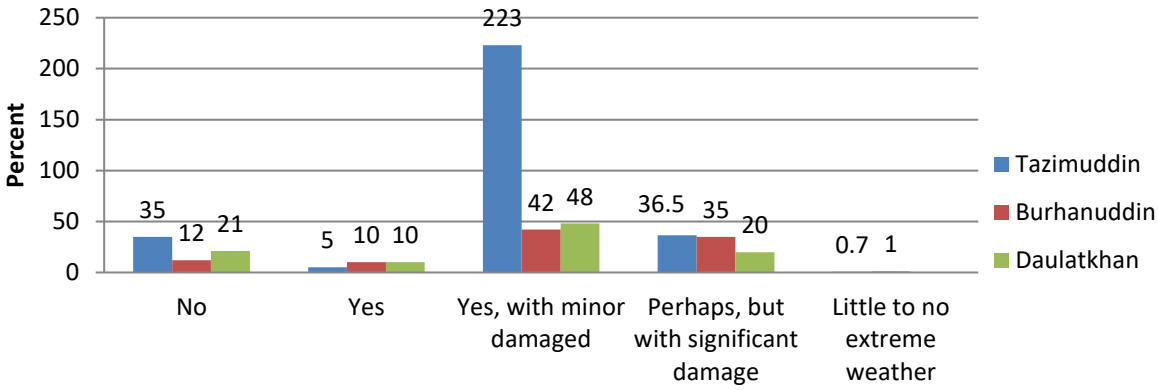


Fig. 4.18 Uapzila wise living house withstand disaster

Sanitation and water sources

The access to sanitary latrine showed very poor (only 9%) (Figure 4.19). This is 19% in Daulatkhan upazila. Most of the people in all three areas were using the slab with ring toilet (Figure 4.20). The hanging latrine was using 6%. Most of the people used drinking water from the tube-well in all three areas and they had to depend on community, government and neighbor sources (Figure 4.21). According to the ownership of this source was found highest from the community (39% to 41%), followed by government (14% to 31%), and neighbors (15% to 20%) and then shared in these three areas, but fully own was found very low (2% to 5%) (Figure 4.22). It is remarkable that 29% of them could not meet the sufficient water requirement through these facilities varied 21% to 33% in all three upazillas (Figure 4.23). Another significant concern was that a significant number of females (34% to 52%) were not satisfied with the safety issue from these sources of drinking water which was the highest in Daulatkhan (Figure 4.24). Like drinking water, the highest (72% to 93%) used deep tube-well for cooking, a small number of people used pond water (7% to 21%) and river or canal water (1% to 5%) for this purpose (Figure 4.25) though they did not have fully own (only 4%) of this sources (Table 4.4) rather this was supported by community, government and neighbor, and their water requirements for cooking was not sufficient (22% to 31%) (Figure 4.26). Like the sources of drinking water, the safety issues among the females were great concern in those cooking water sources, where 62% in Tazimuddin, 52% in Daulatkhan and 37% in Burhanuddin mentioned that these sources were not safe for females concerning safety issue (Figure 4.27).

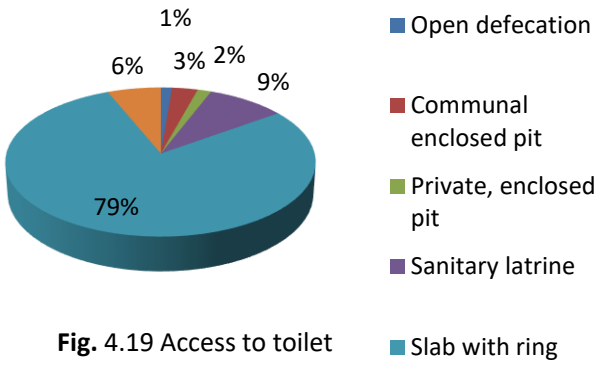


Fig. 4.19 Access to toilet

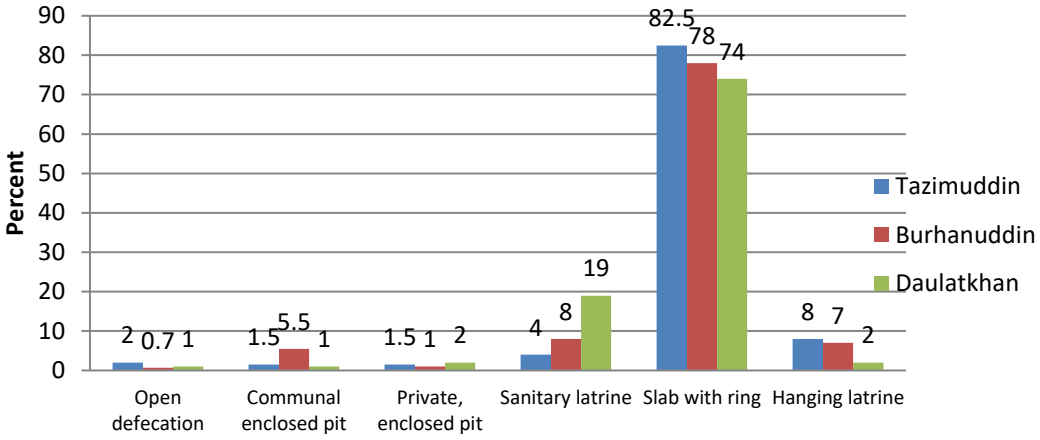


Fig. 4.20 Upazilla wise access to toilet

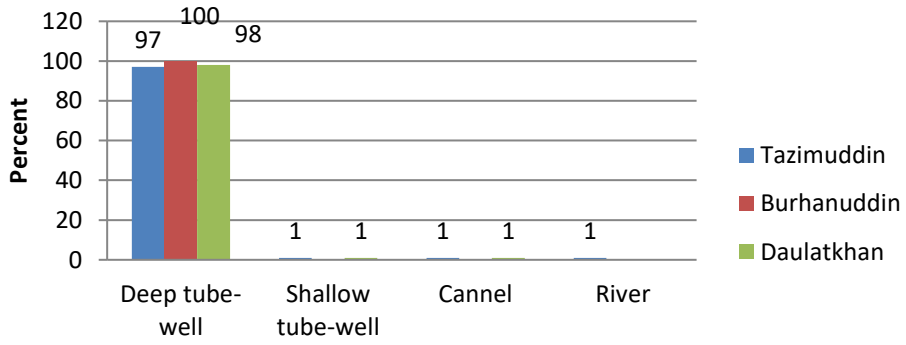


Fig. 4.21 Source of drinking water

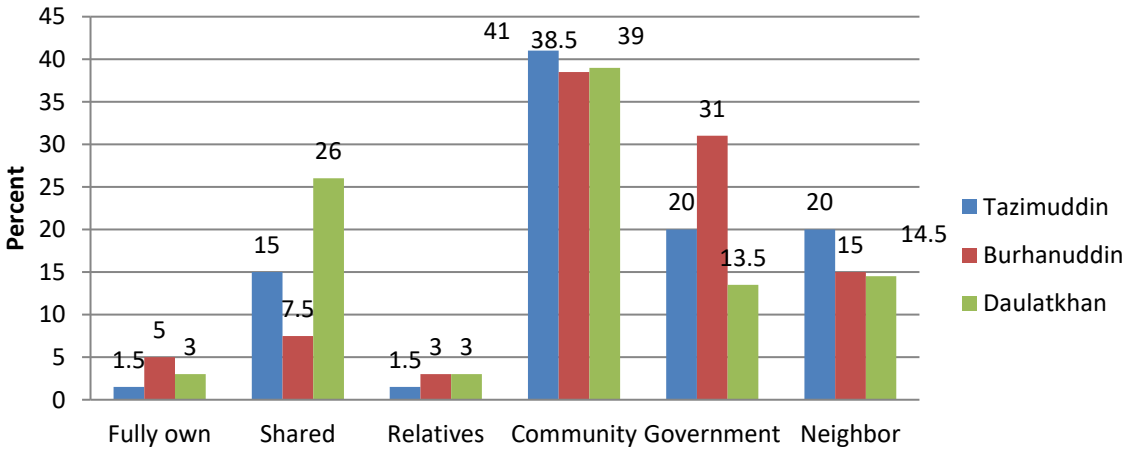


Fig. 4.22 Ownership of water source

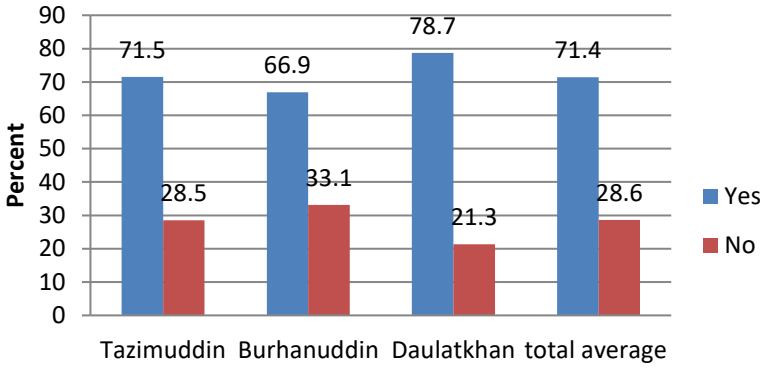


Fig. 4.23 Sufficient to meet the water requirements

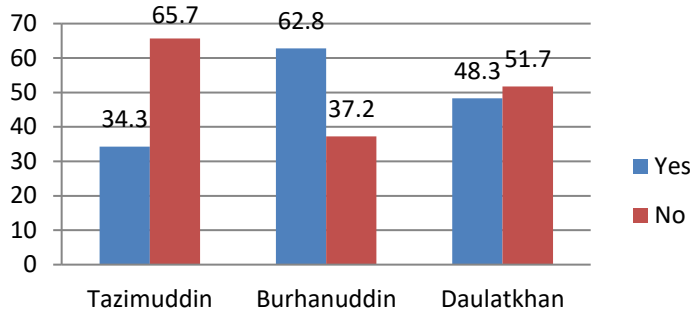


Fig. 4.24 Safety issue for the female

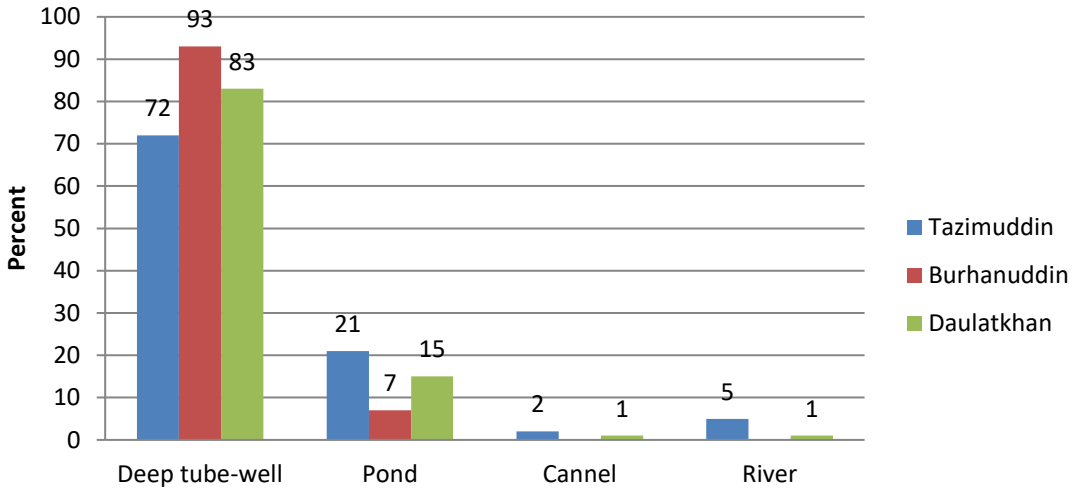


Fig. 4.25 Source of cooking water

Table: 4.3 Ownership of cooking water source

Nature of ownership	Upazila			Total
	Tazimuddin	Burhanuddin	Daulatkhan	
Fully own	1.5%	6.9%	3.4%	4.0%
Shared	22.6%	9.7%	28.1%	18.9%
Relatives	2.2%	4.1%	3.4%	3.2%
Community	35.8%	38.6%	38.2%	37.5%
Government	21.2%	26.2%	13.5%	21.3%
Neighbor	16.8%	14.5%	13.5%	15.1%
Total	100.0%	100.0%	100.0%	100.0%

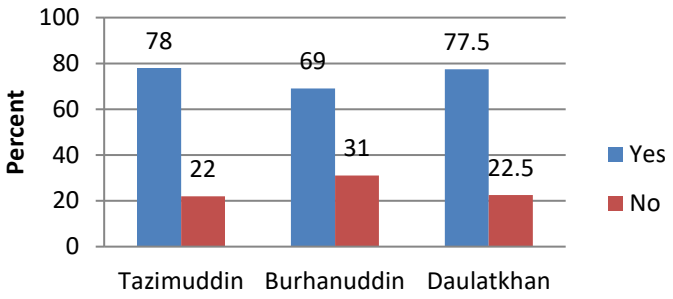


Fig. 4.26 Sufficient to meet the water requirements

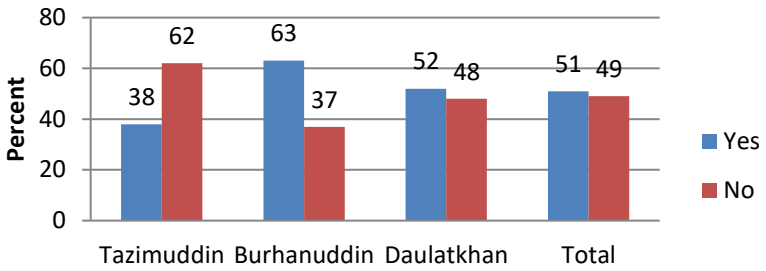


Fig. 4.27 Safety issue for the female

Table: 4.4 Economic vulnerability: Times and types of affected land by river erosion

	Year	%		Average times per household	Catastrophic (%)	
		Yes	No		Yes	No
In the last 5 years, how many times HHs have experienced river bank erosion? Which one was the most catastrophic?	2013	43	57	1.04	38	62
	2014	24	76	.86	54	46
	2015	22	78	1.13	45	55
	2016	21	79	.81	34	66
	2017	25	75	1.02	53	47
Between 2013 and 2017, is there any agricultural land of your households was affected/degraded due to river bank erosion?	Yes	No	If yes, average decimal per household 56.37		If yes, average per household monetary value in Tk. Tk. 1,85,885	
	36%	64%				
Between 2013 and 2017, is there any homestead land of your households was affected/degraded due to river bank erosion?	Yes	No	If yes, average decimal per household		If yes, average per household monetary value in taka	
	58%	42%	28.48		3,40,094	

Vulnerability

Economic vulnerability

The river erosion affected people were asked whether they were affected by river erosion between 2013 and 2017. Data showed that the highest number of people were affected in 2013 (43%), and after that, this number decreased gradually except in 2017 (25%) (Table 4.4 and Figure 4.28). Data also showed that every household averagely faced one time of river erosion each year, where nearly 50% of the households mentioned this as the catastrophic type of river erosion (Table 4.4). It is noted that the Government took massive initiatives e.g., embankment recently. But a significant number of people were affected by river erosion in the recent time. They were affected multiply. Data showed that between 2013 and 2017, 36% of the household mentioned that their agricultural land was affected by river erosion and it was average 56.37 decimal per households and its economic value was Tk. 1,85,885. On the other hand, 58% of the households mentioned that their homestead was affected by river erosion on that time,which is average 28.48 decimal per household, and its economic value was Tk. 3,40,094. The loss of homestead land was the highest (55%), followed by loss of land (53%), loss of homestead infrastructure (52%), scarcity of pure drinking water (41%), crop loss (30%) and livestock loss (29%) (Figure 4.29). Only 1% of the household mentioned 'no loss' by river

bank erosion. From upazila wise agricultural loss, the study found that the highest 50% mentioned in Burhanuddin that they faced this loss which was 30% in Tazimuddin and 21% in Daulatkhan (Table 4.5). On the other hand, 65% of the homestead land was affected in Burhanuddin which was 58% in Tazimuddin and 45% in Daultakhan (Figure 4.32). On an average, the number of homestead damaged people was found highest (58%) and agricultural land damaged 36% (Figure 4.33). From money value, the highest 46% of the households' loss was between Tk. 100 to 20,000, followed by 30% of them Tk. 1,00001 to 5,00000 (Figure 4.30).

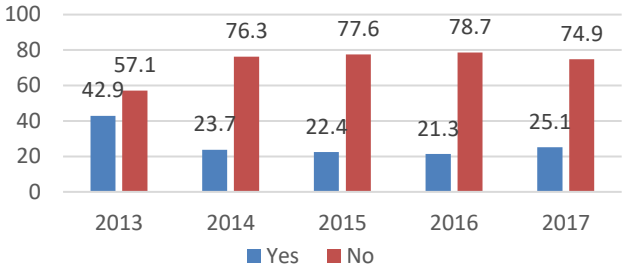


Fig. 4.28 HHs affected by RE in the last 5 years

From a FGD session, many people reported us to explain about their vulnerability such a way:

> Ash is still there if it is fuel by fire, but nothing is left if anything washed away by tidal/flood (Agune purle sai thake gange vangle kisui thake na)

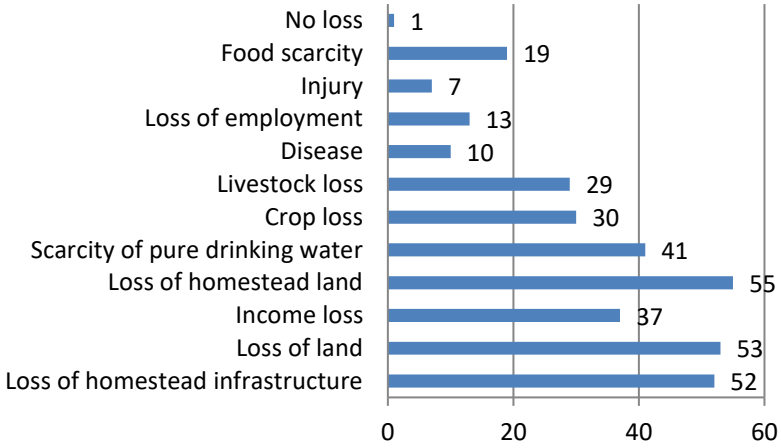


Fig. 4.29 Type of losses (%)

Table 4.5 Types of loss

Type of losses	Tazimuddin	Burhanuddin	Daulatkhan
Loss of homestead infrastructure	52.6%	60.0%	39.3%
Loss of land	51.8%	59.3%	43.8%
Income loss	43.1%	39.3%	22.5%
Loss of homestead land	51.8%	66.2%	41.6%
Scarcity of pure drinking water	46.0%	42.1%	30.3%
Crop loss	31.4%	37.9%	14.6%
Livestock loss	35.8%	30.3%	16.9%
Disease	19.0%	4.1%	5.6%
Loss of employment	19.7%	4.8%	14.6%
Injury	9.5%	1.4%	12.4%
Food scarcity	16.1%	16.6%	27.0%
No loss	.7%	1.4%	.0%

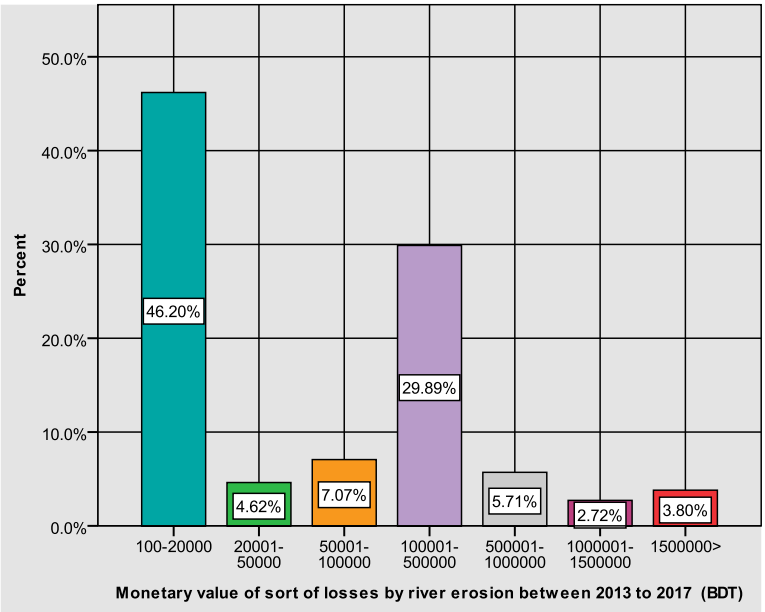


Fig. 4.30 Monetary value of losses by river erosion

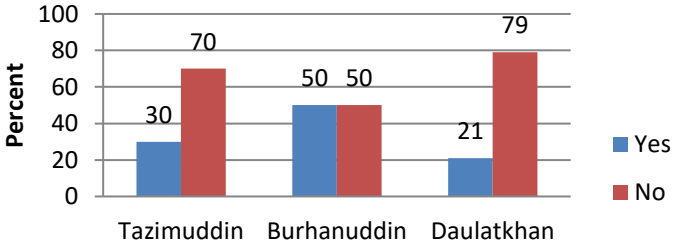


Fig. 4.31 Between 2013 and 2017 agriculture land affected by river erosion

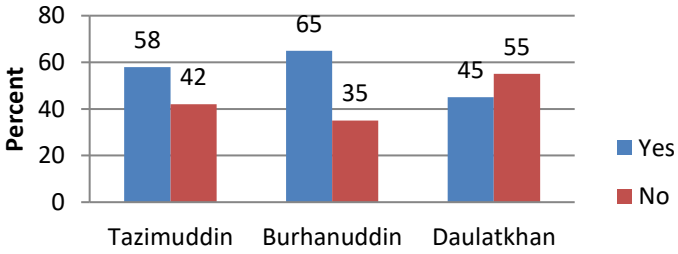


Fig. 4.32 Between 2013 and 2018 homestead land affected by river erosion

Bachu Mia has been struggling since his childhood due to river bank erosion

Bachu Mia (55 years old) is living at Bhuiyakandi village under the Chandpur Union of the Tazimuddin Upazila. He is the fifth child of his parents out of total 9 siblings. From his very childhood, he is facing river bank erosion massively. His grandfather had limited land, which was totally lost before his born. His father was a landless. He worked as fishing and agriculture labour and had to bear all expenses of a family with 11 members. So, there was no scope for him and his siblings to be educated due to extreme poverty. With other brothers, he had to start work as an agriculture day labourer from 12 years age in a view to contribute to the expenses of a big family. They had a straw made tiny shelter for living of 11 members. Though they were poor, there was happiness in their family. Moreover, river bank erosion in 1978 washed away everything of their household, which made them most vulnerable. For this erosion, they had to shift their house to nearby Sonapur Union. In 1983, they faced the same problem and shifted to another place of Sonapur. At that time their father died and had to bury him at other's land, which gave them deep shock. He faced river bank erosion again in 1986, 1995, 1997 and 2001. Though he has lifelong poverty, he was very happy that he got a tiny piece of land to build his house from one of his neighbours. He has been living in this place since 2001with his wife and four daughters. His first daughter got marriage at the age of 16 with dowry by the amount of Tk. 10,000. Now three daughters (2nd- age 16, 3rd 13 and 4th 10) are living with him. He has to do hard work for all day in order to maintain the family expenditures. Due to serious poverty, his 2 daughters were dropped-

out from school and only youngest daughter is continuing her study in a government primary school. Usually, he is involved in fishing labour and sometime work as agricultural labour. In his life time, he received only 30 kilogram rice. He also received assistance from the Islamic Relief (IR). He purchased a cow and received cow rearing training from IR.

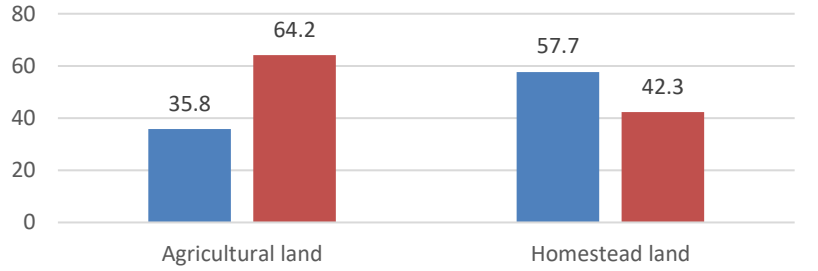


Fig. 4.33 Agriculture and Homestead land damaged for RE between 2013 to 2017

Social dignity: Psycho-social vulnerability

The study explored vivacious information on different psycho-social, cultural and social dignity related aspects from the river erosion affected people by using Likert 7-scales (Table 4.6). The overall data showed that all of the respondents were strongly agreed on different aspects of the psycho-social and social dignity related vulnerabilities on their livelihoods. Around 70% of the households mentioned that they were strongly agreed on two aspects such as 'river bank erosion has increased poverty in our community river' and 'river bank erosion has forced the displacement of the household' followed by other issues such as 'we feel insecurity because of river bank erosion' (64%), we feel helpless during river bank erosion' (63%), 'many schools and social institutions were damaged by river bank erosion' (63%) and 'participation of river erosion victim in recovery process has controlled by the political institutions and local power politics' (62%). The food insecurity, breaking socio-cultural bondage and networking, decrease social esteem, and problems of destitute people, and displacement were mentioned by around 50% to 59% people. The number of disagree and strongly disagree and even on 'no comment' households were found very low. Data showed that 17% households were strongly disagreed on 'many people in our locality were involved illegal practices due to river bank erosion', followed by 16% on 'child marriage has increased due to river erosion', and 15% on 'my household occupation pattern has changed due to river bank erosion' who were strongly disagreed with this comment.

Table: 4.6 Psychosocial vulnerability and social dignity

Type of psycho-social vulnerability	**Strongly Agree**	**Agree**	**Somewhat agree**	**Somewhat disagree**	**Disagree**	**Strongly disagree**	**No comment**
My family member (s) are suffering from physical or mental disability because of river bank erosion	48.8	24.0	7.8	1.9	11.1	6.5	00
My social and cultural bondage has been broken due to river bank erosion	55.0	33.7	6.7	1.1	2.7	0.8	00

My networking has been broken down due to river bank erosion	50.1	30.7	12.7	2.7	3.0	0.8	00
My household occupation pattern has changed due to river bank erosion	23.0	18.1	15.6	6.7	14.8	15.4	1.3
River bank erosion has increased the inequality among the society	49.9	32.3	11.6	3.2	2.7	0.3	00
River bank erosion has decreased our social esteem	51.2	24.3	13.2	3.0	6.2	1.1	1.1
River bank erosion has created psychological problem	34.0	36.4	19.7	4.6	3.5	0.3	1.6
We feel helpless during river bank erosion	63.1	23.2	5.4	4.3	3.8	0.3	00
We face tremendous challenges with our older people, pregnant women, disabled people, widow and children during river bank erosion	50.7	29.1	15.1	2.4	2.4	0.3	00
Many of our relatives, neighbors and community people moved to another place because of river bank erosion	59.0	28.3	7.8	2.4	2.4	00	00
We feel lack of association in the community due to river bank erosion	46.6	32.6	12.4	3.8	3.5	1.1	00
Our mental stress, depression, and anxiety are associated with river bank erosion	45.3	35.0	15.9	1.6	1.9	0.3	00
Gender based violence has increased due to river erosion	25.9	14.6	17.0	9.7	22.1	7.0	3.8
Child marriage has increased due to river erosion	29.9	20.8	12.1	8.4	10.8	16.4	1.6
We feel social distance due to river bank erosion	40.2	35.3	14.0	4.6	4.6	1.3	00
We feel insecurity because of river bank erosion	64.2	26.1	5.9	0.5	2.2	1.1	00
Many people in our locality were involved illegal practices due to river bank erosion	28.0	17.3	7.8	3.8	23.7	16.7	2.7
We did not find any job/work during river bank erosion	31.5	26.4	14.6	5.7	15.6	5.7	0.5
River bank erosion has increased poverty in our community	71.2	21.8	5.7	0.5	0.5	00	0.5
We do not get any loan facility from NGOs during river bank erosion	34.5	22.4	13.2	2.7	13.2	8.6	5.4
Many schools and social institutions were damaged by river bank erosion	63.1	22.1	4.3	3.0	6.2	1.1	0.3

River bank erosion has created food insecurity among the HHs	51.5	34.2	10.0	2.2	2.2	00	00
River bank erosion has forced the displacement of the HHs	70.1	20.8	6.2	1.9	0.5	0.3	0.3
Participation of river erosion victim in recovery process has controlled by the political institutions and local power politics	62.3	20.5	12.4	1.9	1.1	1.3	0.5

The study captured a number of aspects related to social dignity and social vulnerabilities through qualitative methods. One Research Associate took an overall field note from the Bhabanipur Union of the Dulatkhan Upazila:

> All of the river erosion affected people were staying in the embankment. They did not have any sense of hygiene. Sanitation system was extremely poor. Almost all of the families used hanging toilet and many of them used open places. The children were suffering from severe malnutrition. They did not have any idea about family planning. All of the families did not willingly take family planning methods. Many families have eight and nine children, and even some of them have 12 children. They were living together in a single room with a very congested environment. They did not have personal life, security and confidentiality.

Abdul Malek: Family separates me but I cannot be separated from river

Abdul Malick, a fisherman is now living at Bhabanipur Union. He is 60 years old. He lives with his one brother, and second wife and his one daughter who is physically disabled. He has another two sons from his first wife and they are now separate from his household. His daughter's name is Halima. She is a student in year IX. His wife is Sayra Begum and she is a housewife. Malick has involved in fishing when he was 12 years old. Fishing is his ancestor occupation as his father and his brothers were also involved in fishing. They had a big homestead, where he lived with his father, mother, sisters, two brothers and one sister-in-law (elder brother's wife). They lost their homestead land by river erosion 30 years ago. I can remember, it was rainy season, the river erosion just started. We understood that we cannot live in our homestead. The condition of river erosion looks very caustic. Then, we take decision to move to other cropland which is another side of the river. We made a temporary house on our cropland and shifted immediately, and we started our live. After that, my father comes to my house regularly. But after 3 to 4 days, our houses again destroyed by river erosion. My father still stays there and saw the homestead land destroy fully. After losing the land, he was crying a lot. He did not return from there. The people informed me that our father still stayed on there and crying. We again rebuilt another house in a tiny place that we received from my relative. This house was also close to river. We took my sick father to this house. My father became sick over time. He never back well. After 6-7 years, our homestead again destroyed by river erosion and then my father died. After two years, my mother also died. Due to financial crisis, I face a lot of family conflict with my wife. My disabled daughter grew up and I could not get any support from my family members. I was bound to be isolated from my family. Many people advised me to move elsewhere, but I cannot. I have no option to move for my livelihoods as I have no skill to do any work except fishing. My luck, family separates me but I cannot be separated from river.

Bibi Rabeya, a 40 years old woman in Bhabanipur Union, was very emotional when she was asked about the river erosion, tear was trying to get out from her eyes. She had witnessed three times massive riverbank erosion in her life. 25 years ago, she displaced from Mathvanga to Kandir Bil for the first time. Then her family displaced from Kandir Bil to Bhavanipur. Finally, they moved several times in Bhavanipur and their houses went under river. Lastly, ten years ago, they made their house at this place. Bibi Rabeya said, 'When the river bank is erased, our life is like soulless. When we see flood and cyclone (tufan), we always in a fear and think what will happen in our life'? During river erosion we cannot make any cash capital. When river comes near to our house, our planted trees, lands, and houses go under water, I feel one member of my family whom we lost in the river. We are seeing river erosion since our childhood, so our heart is enough hard enough to bear the shock.

The study captured some exceptional findings from a widow in Bhabanipur Union:

After river erosion the affected people had to save their rest of the belonging to the nearby local rich people as they have no other options to keep those in their own safe place. This gives the opportunity to the rich people as they get money by the cost of this belongings. This is impecunious to us but advantageous to the rich (Amder theka maliker lav).

Many people of Bhabanipur Union reported us in FGD sessions:

We do not have any social dignity and honour in our social life in the community. We have threat and dishonours from the urban people as 'river erosion victims (Gange vanga lok or nadi vange lok). We have a lot of exploitation such as we get less wage from our work.

A 70 years old widow Fazilat in Daulatkhan expressed his speech such a way:

Oh river be kind to us, do not destroy our inherited house, our homestead land (O nadi nadire aktu daya kar, vangis na ar baper vita basat bari ghar).

A middle aged women in Daulatkhant described:

I cannot keep myself with calm and quiet in my life due to river erosion. I pass the most of my time to think about my food and shelter. I feel repentance that I could send my children to school. I have to move 5 times due to river erosion and I have to stay at the corner (narrow place) on the embankment. I do not know how I will pass the rest of days in my life.

Zainal Abedin, a 55 years old person mention:

So far I stayed a number of embankments such as Amani Bazar Beribadh, Shaheber Hat Beribadh, Batala Beribadh and Farazikandi Beribadh. Now I am living Bhabanipur Beribadh. I lost many of my friends due to this displacement, even I cannot give medical treatment to my wife who died later. I feel so loneliness as I have no wife and friends.

Regarding child marriage, many local people told us:

We cannot protect the early/child marriage during river erosion. In many cases we tried to stop this but it has been settled down from other places.

Social dignity of a widow:

Monju Begum (35), a widow, lives at the Chadpur Union in the Tazumuddin Upazila. Her family consisted with 4 members. Monju's family had faced river erosion for seven times.

She lost her husband in 2015. After lost her husband Monju became a house maid. She was helpless to bear the expenses of family. She stopped her elder son's education and sent him to city area for income. But during river erosion she faced economic hardship as there is no paid work near to their house in one hand, and she cannot send her child to far way for income on the other. She is worried about her security as well, because her house is very close to the river basin which has possibility to further erosion. She expressed her feeling: 'The life of widow is punishment from almighty. I tried to arrange three meals for my children, but I cannot, even I do not get widow allowance, because I am not old enough to get this. Day by day I become fragile and helpless. I am worried if I die who will take care of my children'.

Regarding social dignity, Zakir Hossen Chowdhury (47 years) in Daulakhan describes the downgrading of his social dignity:

I am hailed from a rich family and I lost my 30 acres land by river erosion. I have seen nobody is interested to listen my sufferings. The affected poor people can appeal for relief and other assistances from local government and administration, but I cannot do this. I feel shame and get hurt on my self-respect. My time is so stressful. I have no properties, even a decimal of land in this world. I see that three kilometers of land was damaged by river erosion within 22 days in 2009. I see that a village Bazar was destroyed where 244 shops and families lived. Only 35 families could stay there and all others were displaced and migrated who lived with their 100 years inherited habitants. I see that like me none of the people wants to introduce their family titles such as Chowdhury, Bhuiyan, and Mia. I saw that The River Meghna created thousands of fishing labourers who lost their own lands by river erosion. Now they moved from farmers to fishing labourers. I am passing with many untold pains that I cannot express to anywhere. I lost my all memories even my parents and grandparents' graveyards. I am thinking if I could buy one decimal land for my graveyard!

Child labour is very common

The study team captured the scenario of child labour in all there Upazillas where this was a common practice. In every boat, minimum one child worker is engaged who helped to take care the fishing boat. However, children are more demandable to these areas. Many children are engaged in collecting shrimps from the rivers. Many children are found working at the household and helping to their parents for making fish net.

River erosion erupt aged person's life: Case of Monwara

Monowara, a sixty-five years old woman lives in the Chadpur Union under Tazumuddin Upazila. Her husband had six acres of lands, which was enough for them to lead a satisfactory life. She faced river erosion five times in her life, but last time, river washed away all of her assets including homestead. She recalled her past experience and described: 'Within one and a half hour, I saw that I am no more a rich farmer rather a refugee who is poorer than a beggar. I lost everything that I love.' At present, her family takes a shelter to one of her neighbour's house who worked in her land before river erosion. Now, Monowara and her family is fully

depend on this neighbour. Now, Monwara is working as a maid servant of this neighbor. Monwara expressed her feelings: 'Once upon a time many people worked in my house, many people respect me a lot, my social dignity was high and I can move freely in my territory. Now I am working as a house maid. I have no honour and prestige, I am so unblessed, and my livelihoods are totally disgraceful.

River erosion has increased insecurity among girl children

A 40 years old widow named Lovely is now living in the Pakshia Uinon in the Burhanuddin, Upazila. Her family is consisted with three members with her two daughters. She lost her husband in 2011. She noted that her family had experienced of river erosion for 10 times and lastly in 2013, while this was more catastrophic and she lost everything. She was a housewife. After her husband's death, she became only earning member of the family, which made her a seasonal day labourer and house maid. Her life started with many new challenges. Lovely told that her daughter has got sexual harassment several times as they have no male guardian. Lovely described: 'After the erosion in 2013, I with my two daughters went to one of my relative's house. The relative gave us shelter with a condition that I and my daughters must work in their household chores. But after few days, the relative's son began to disturb to my elder daughter, who is sixteen years old. He always offered her for 'kharap kaj' (sexual relationship). I am well known about this matter and I also know that my daughter has no fault. But now I am not able to protest it as this is the only shelter for my family and I do not want to lose it. Indirectly, I tried to tell the matter to one of my relatives, but in return my relative accused my daughter, not the boy. In addition, I and my two daughters must work morning to evening, but it pays a little- just some foods for my family. It is a clear exploitation to my family, but I have nothing to say as my relative already said that if I have any complain, then I may go off. For this reason, I never say anything to my relative and waiting for a day when I will find another job and will be able to move with my family from this house. At present I am praying to God for a new job that will help me to get rid-off this dirty environment'.

Migration and displacement

Data showed that 95% of the households had to displace due to river erosion (Table 4.7), where this was 98% in Daulatkhan Upazilla (Figure 4.34). The highest 35% had to displace 1 to 2 times and 32% of them 3 to 4 times (Figure 4.35). The study found that 23% of the households displaced twice in the last five years (2013 to 2017), followed by 20% thrice, 12% four times, 11% five times and 9% seven times. According to the data of their last displacement, the highest 44% of the households displaced during 2013 to 2015, even 19% displaced recently (2016 to 2018) (Figure 4.36). The erosion affected households mentioned multiple causes behind of their displacement. The highest number (83%) mentioned they were displaced in order to avoid river erosion in future, followed by 36% avoid inundation, 34% loss of homestead, 27% to protect household from cyclone and 24% to avoid water logging (Figure 4.37). However, most of the causes was temporary as only 8% mentioned this cause as for better life style. From the data of the place of displacement, the study found that the highest 30% of the households were displaced to the embankment, 22% to relatives' house and 16% to the government and non-government's shelters (Figure 4.38). Only 19% were displaced to their own land in another places. Below 1% of the affected households displaced at school and adjacent villages.

Table: 4.7 Displacement and time

Had to displaced due to river erosion		
	f	%
Yes	351	94.6
No	20	5.4
Total	371	100.0
How many time had to displace		
1	44	12.5
2	80	22.8
3	70	19.9
4	41	11.7
5	37	10.5
6	22	6.3
7	32	9.1
8	12	3.4
9	5	1.4
10	5	1.4
11	3	.9
Total	351	100.0

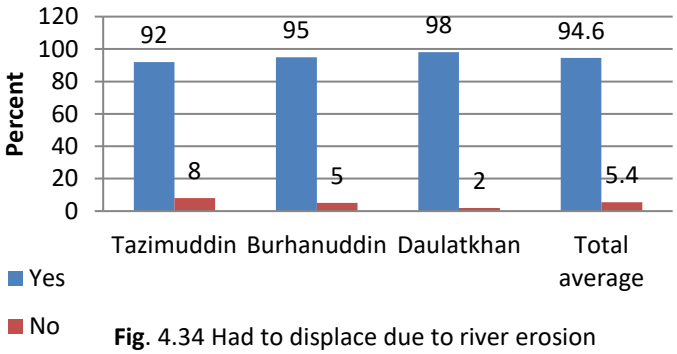


Fig. 4.34 Had to displace due to river erosion

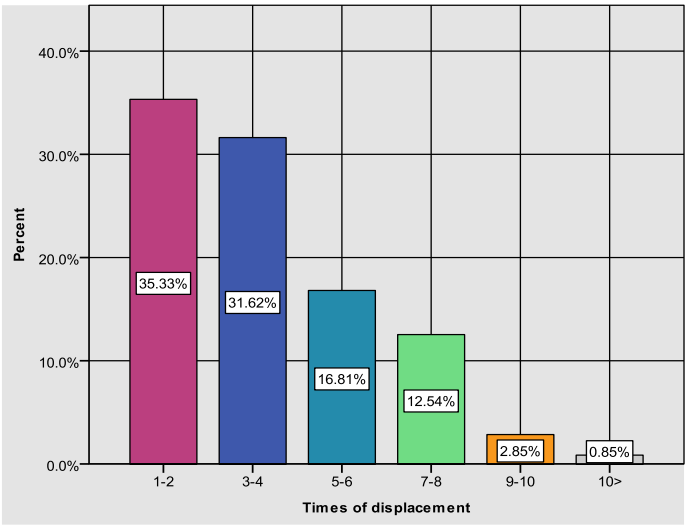
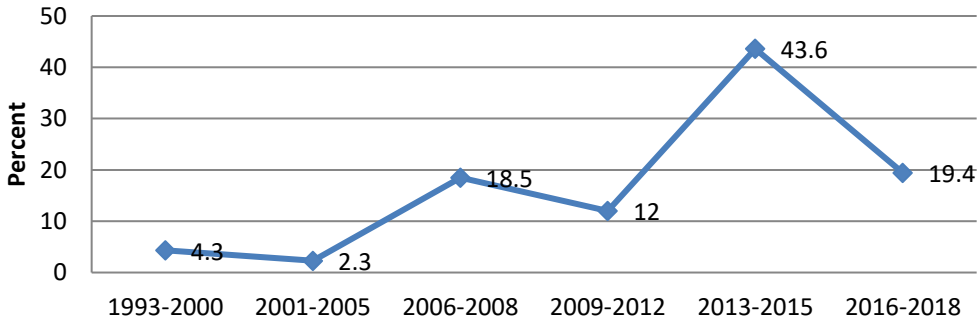
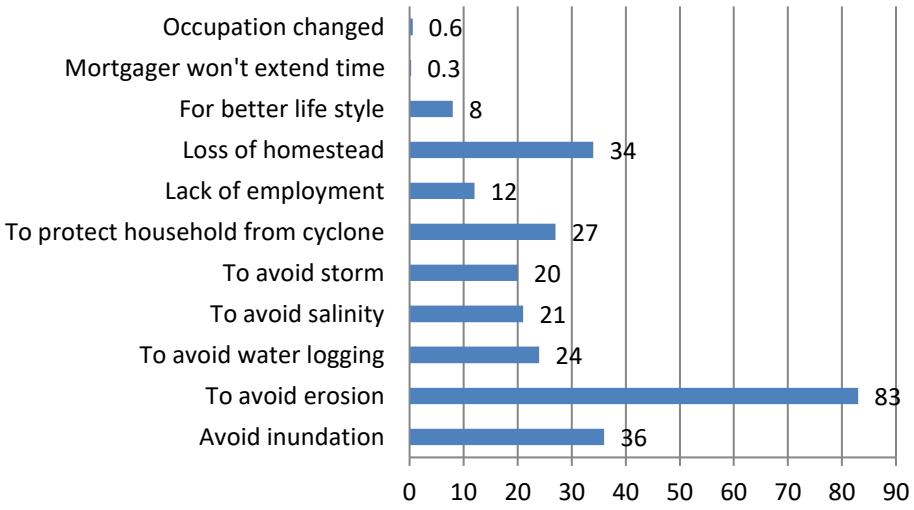


Fig. 4.35 Time of displacement

Fig. 4.36 Last displacement





Fg. 4.37 Causes of displacment (%)

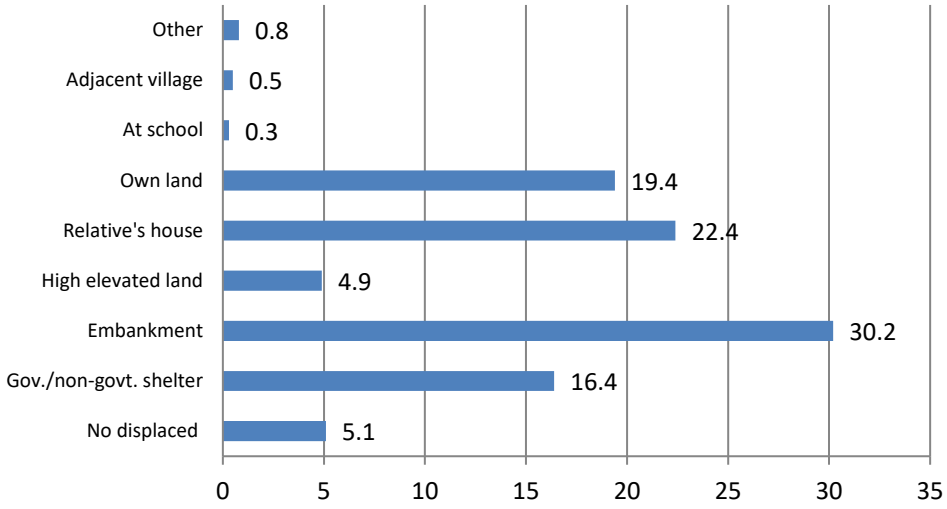


Fig. 4.38 Places of displacement (%)

The household heads were asked whether they had a plan to do 'planned displacement' in future, 46% of the households mentioned that they had a plan to do this displacement and 54% mentioned 'no' (Figure 4.39). Among those who had a plan to do plan displacement, they showed a number of reasons (Figure 4.40), and the highest 70% of them mentioned to avoid river bank erosion further, 42% to avoid disasters, 33% to avoid inundation and 19% to avoid water logging. Data showed that 32% of the households wanted to displace for better life and 9% each for lack of employment and influence of power structure. The household heads were asked whether their family members migrated to other places for livelihoods due to river erosion, data showed that a very small numbers of them were migrated to other places which was found highest in Burhanuddin (29%), 15% in Tazimuddin and only 8% in Daultkhan (Figure 4.41). On the other hand, again a small number of people migrated other places for permanently which was the highest (16%) in Burhanuddin, 10% in Tazimuddin and 9% Daulatkhan (Figure 4.42).

The qualitative data showed a different picture. One FGD participant in Burhanuddin told:

> Only the people who have money can buy new lands for building their new houses after river erosion, many who have no money cannot buy land and they have stay at the embankment without any option.

The Social Service Officer of the Daulatkhan Upazila described the long impact of river erosion on human life:

> After river erosion, the massive migration and displacement occurred immediately. The affected people who are well-off go to the nearby cities and the marginal people move to the slums of Dhaka and Chittagong. Some people still stayed at the affected areas. Due to financial crisis and lack of social security, many girls are involved in illegal occupations such as sex workers and beggars. River erosion sometimes encourages these girls to early marriage and dowry.

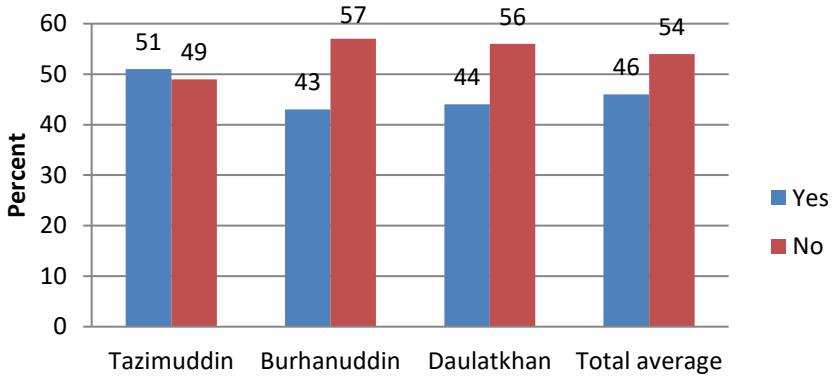


Fig. 4.39 Plan to be displacement

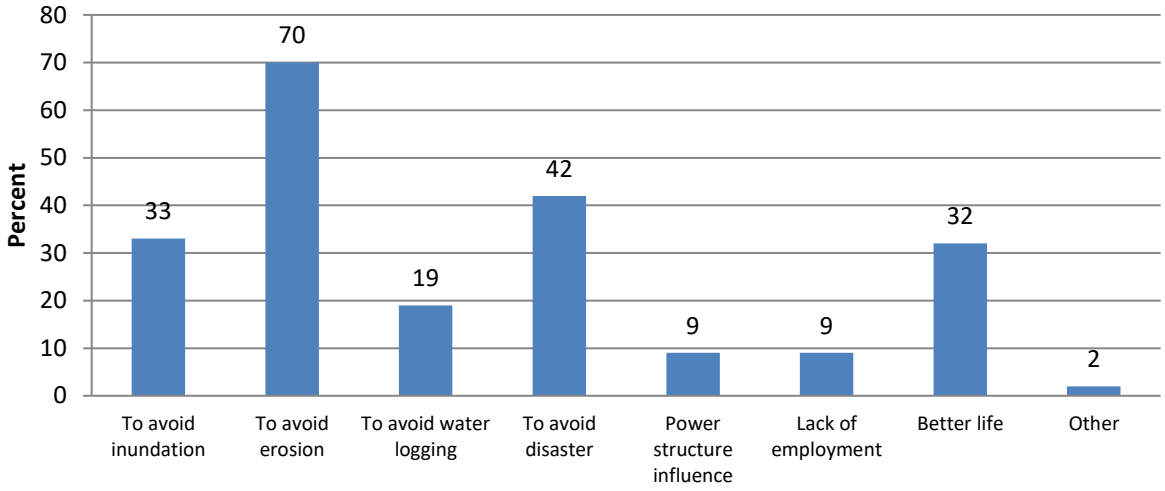


Fig. 4.40 Reasons of plan displacement

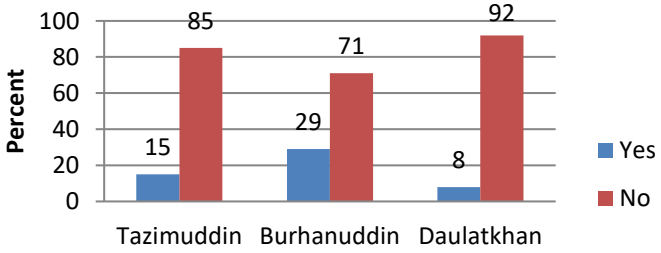


Fig. 4.41 HHs member migrated to other place for livelihood

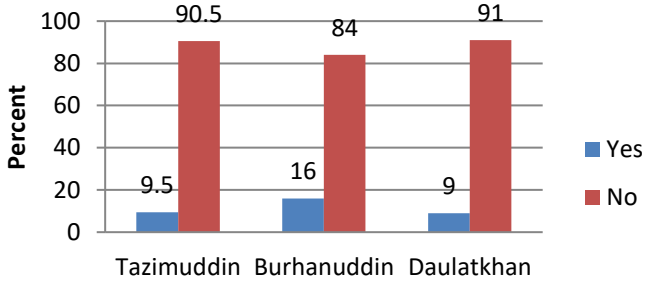


Fig. 4.42 Migrate other place permanently

Livelihood options

A highest number of people were depended on natural resources for income and consumption during river erosion. Data showed that 78% in Daulatkhan, 72% in Tazimuddin and 57% in Burhanuddin depended on natural resources for income and consumption (Figure 4.43). They were engaged in different types of activities, among those, the highest 85% of them were catching fish, followed by 22% crop cultivation. The rest of the people were engaged in livestock rearing, and shrimp larvae (Figure 4.44). Main income related livelihood options were mentioned as catch fishing labour (47%), day labourer (44%), catching fish own (33%), crop cultivation (15%), small business (14%) and livestock rearing (10%) (Figure 4.45).

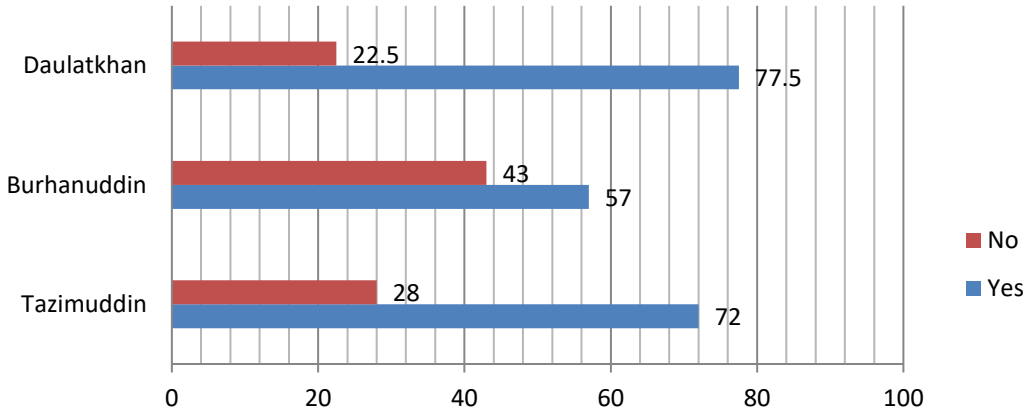


Fig. 4.43
Dependency on natural resources for income and consumption

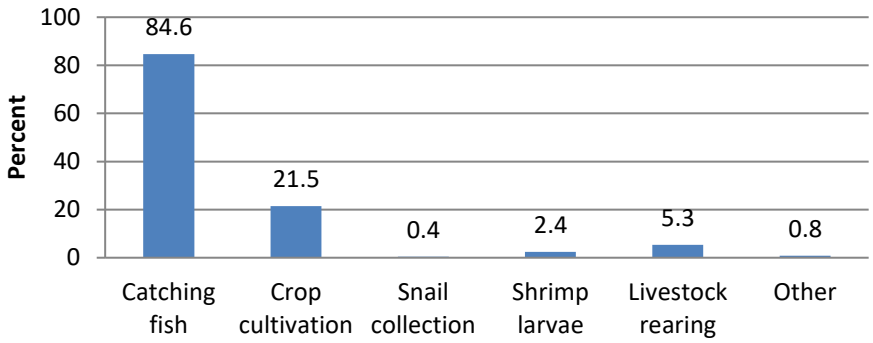


Fig. 4.44 Activities are engaged for income (multiple answer)

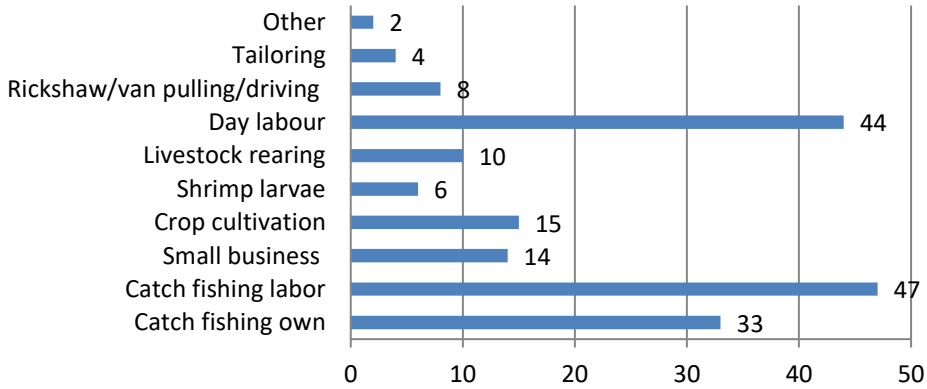


Fig. 4.45 Major livelihood options of your HHs

One woman aged 85 years in the Bhabanipur Union reported us:

> My house has been damaged 17 times in my life, but still I would like to stay at very close of the rivers as my household's income fully depends on the river sources. This is very easy for us to come to the river for income. We do not have any other option except fishing.

A different picture was found from an in-depth case study in Burhanuddin Upazila:

> Zainul Abedin, a 55 years old man informed us:
> This river destroys our lives and properties, but it give us income and food, we are solely depend on this river Meghna.

Md. Sidu Bepari, 80 years old man in Daulatkhan told:

> Fishing is an addiction to us. Therefore, we do not do anything without fishing.

Regarding to choose occupation for the next generation, we found another reverse comment:

> Tahura Khatun, a 60 years old widow woman in Daulatkhan is now living on an old embankment, which is just 100 metres from the river. Tahura is very ill, but she is making fish net for her livelihoods. Her little son is also working as fishing labourer. They do not have any other options except fishing, because there is no other work in this community. Tahura told that she is educating to her son and daughter so that they may not have carry the same occupation in future. They do not want to face this river erosion.

A significant number of the affected people were not satisfied with their current livelihood options which were found the highest 83% in Tazimuddin, 55% in Daulatkhan and 39% in Burhanuddin (Figure 4.46). It is because due to the close distance of the rivers and continuous river erosion and other disasters they faced a number of problems. The problems include lack of capital (52%), lack of knowledge about climate adaptive livelihood options (44%), lack of skills in managing livelihood options (42%), plash food (41%), damage land due to salinity, and water logging (34%). From the data on livelihood changed between 2013 and 2018 (Figure 4.48), it was found that in all three areas, the highest number of people (such as 64% in Daulatkhan, 55% in Tazimuddin and 33 in Burhanddin) did not changed their livelihoods between 2013 and 2018 though they were facing a number of problems. Only 17% to 20% of the households were partially changed this and only 25% in Burhanuddin and 18% in Tazimuddin fully changed their livelihood options (Figure 4.47).

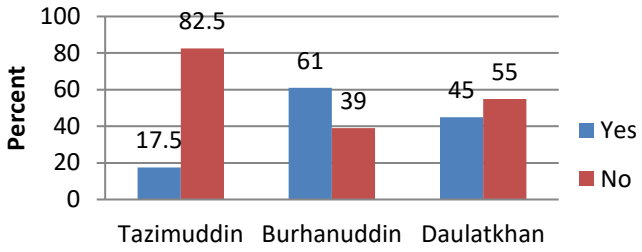


Fig. 4.46 Satisfied with present livelihood option

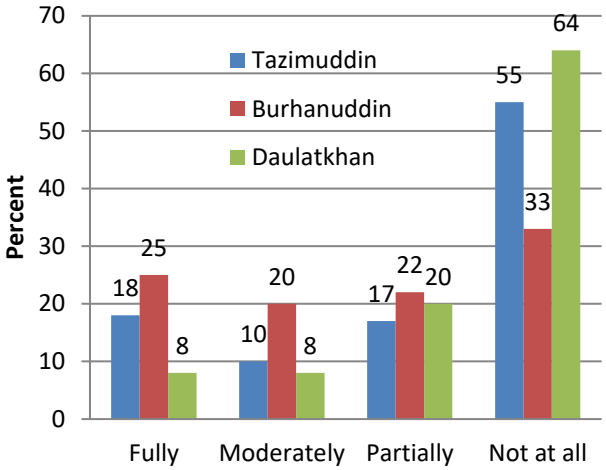


Fig. 4.47 Livelihood changed between 2013 and 2018

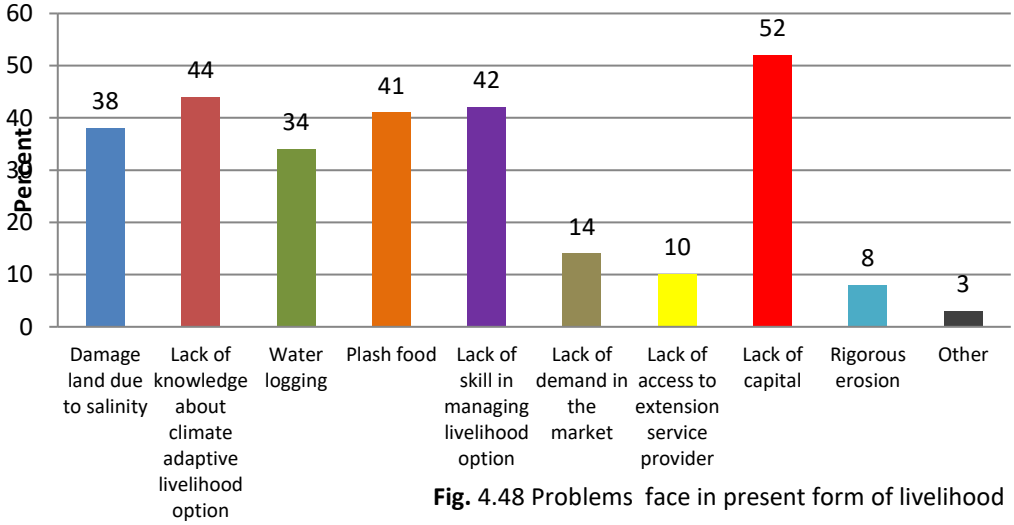


Fig. 4.48 Problems face in present form of livelihood

Nearly 93% of the family members of the households had to engage in come during river erosion, out of these, minimum 1 person was engaged among 45% (51% in Daultkhan and 49% in Tazimuddin upazilas) of the households, 2 persons among 29% households and 3 persons among 15% households. They took skills trainings mainly from thre types of institutions such as NGOs (61%), government institutions (32%) and Islamic Relief (14% in Tazimuddin) (Table 4.8).

Table: 4.8 Engaged of family members in income during disasters

Engaged family members during disasters				
No of engaged members	**Distribution in Upazila**			
	Tazimuddin	Burhanuddin	Daulatkhan	Total
0	4.4%	6.9%	10.1%	6.7%
1	48.9%	37.9%	50.6%	45.0%
2	31.4%	28.3%	25.8%	28.8%

3	11.7%	19.3%	11.2%	14.6%
4	.7%	6.2%	2.2%	3.2%
5	2.2%	1.4%		1.3%
7	.7%			.3%
Total	100.0%	100.0%	100.0%	100.0%
Received training from institutions				
Government	28.6%	38.5%	25.0%	31.6%
NGO	57.1%	61.5%	75.0%	60.5%
Islamic relief	14.3%			7.9%
Total	100.0%	100.0%	100.0%	100.0%

Coping strategies and resilience

The study team asked the respondents about the types of disasters which were more frequent in their locality except river erosion, they mentioned a number of disasters that include salinity, cold wave, tidal surge, cyclone, and flash flood (Figure 4.49). The highest 83% of the respondents mentioned cyclone, followed by 61% flash flood, 33% salinity, 28% tidal surge, and 19% cold wave. 56% of them mentioned that they did not take any pre-caution against hazards at their household level, and 44% told that they took the pre-causation (Figure 4.50). They took a number of pre-cautions to protect the hazards (Figure 4.51). The highest 6% of the households had ready dry food and around 22% to 37% had ready of moveable woven, savings, fire wood, tiding house, plinth rising, and tree planation. A very few households (only 4%) mentioned that they had first aid box. 75% mentioned that they land protect embankment (Figure 4.52). This is significant that only 5% received training on disaster management, and 14% had idea about Disaster Management Committees (DMCs). 52% tried to reduce cost during river erosion and 15% sent income to other places as disaster management (Figure 4.53).

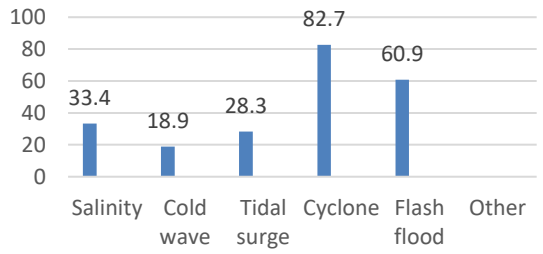


Fig. 4.49 Disaster frequently in locality

Fig. 4.50 Take preparedness against hazards at household level

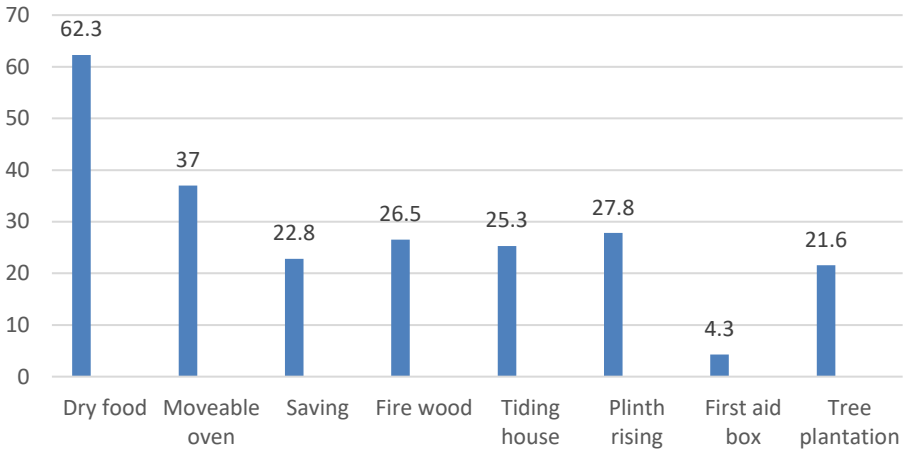


Fig. 4.51 Type of preparedness (multiple answer

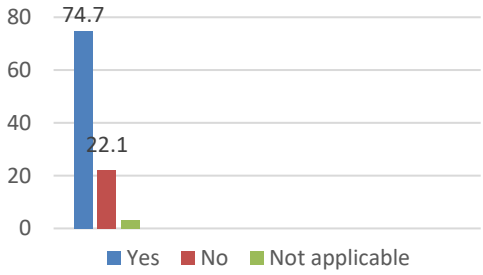


Fig. 4.52 Land protect embankment

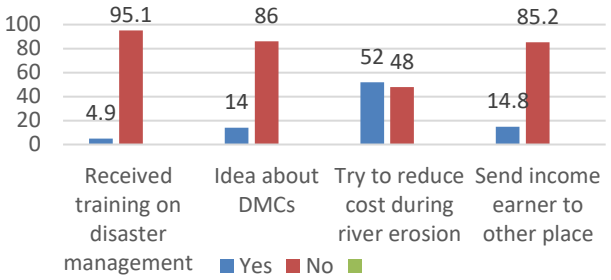


Fig. 4.53 Received training on disaster management

During river erosion, 28% went to the shelter centres, 15% took shelter at their relatives' house and 19% stayed at their own houses, and 15% had to stay at embankments of the rivers (Figure 4.54).

One participant of the KIIs in Daulatkhan reported us:

> The victims of river erosion take shelters at the local places through verbal approval (in local language it is called 'okhrait') from the nearby local people.

The households followed a number of ways to reduce their cost during river erosion such as the highest 87% took less food, 63% had to borrow money from different sources, 44% cut down their clothing and other costs, and 31% borrowed food from relatives and neighbours (Figure 4.56). Findings showed that 25% of the households had no place to keep their cattle during river erosion, 16% kept in their own houses and 12% on the embankments (Figure 4.55). Only 7% mentioned that they kept their cattle at cattle shelter. 32% of the households mentioned that they had to sell their cattle for cash money due to shelters/places and financial crisis (Table 4.9).

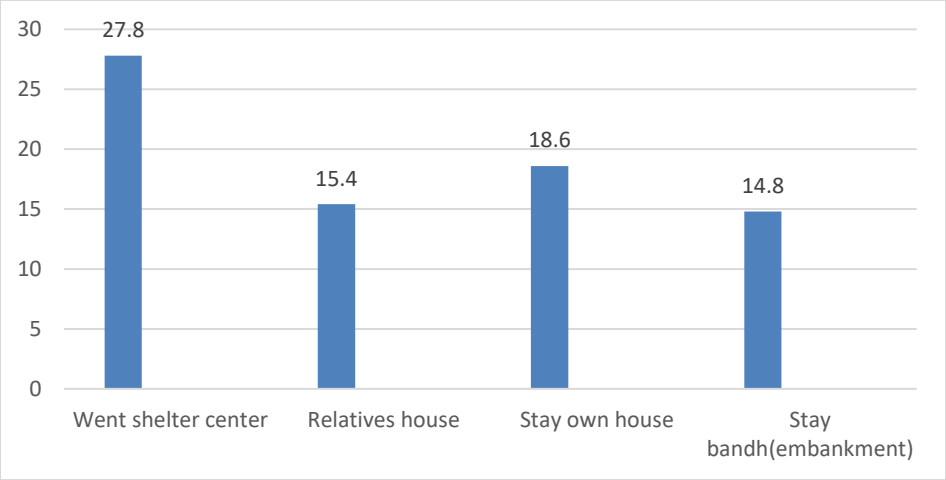


Fig.4.54 Places to go during river erosion

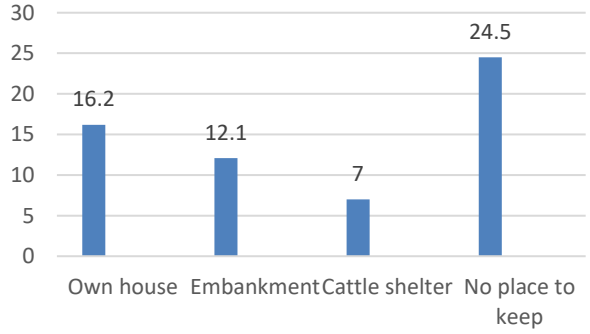


Fig. 4.55 Where keep cattle during erosion

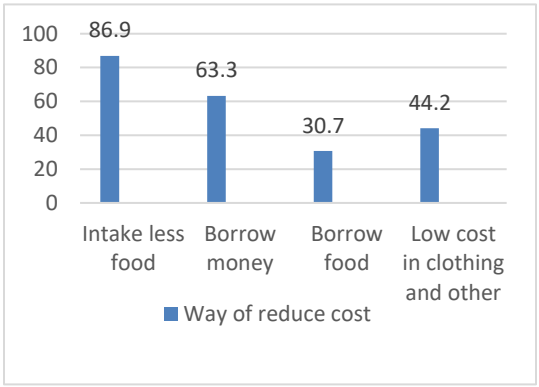
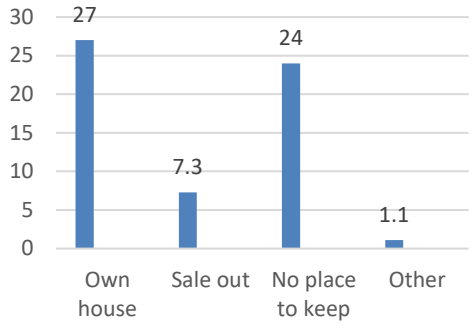


Fig. 4.56 Ways of reduce cost

Table: 4.9 Sale livestock for cash money

Responses on sale livestock for cash money	**f**	**%**
Yes	120	32.3
No	112	30.2
Not applicable	139	37.5
Total	371	100

The households did not have any place (24%) to keep their grain during river erosion, 27% of the households kept this in their own house and 7% had to sale their grain (Figure 4.57). They conceived a number of losses by river erosion such as crop loss (41%), cattle loss (36%), injured 22%) and life loss (6%) (Figure 4.58). The storage system was not sufficient in the areas as 60% of them stored their crops at their own household and less than 1% in the local bazar (Figure 4.59). Only 1% of the people had opportunity to store their crops at government storage and community based seed bank. During hazards, only 9% in Tazamuddin, 10% in Daultkhan and 13% in Burhanuddin received assistance from the Union Disaster Management Committee (UDMC) (Figure 4.60). From government side, these numbers were found only 12%, 8% and 16% respectively in three upazillas (Figure 4.61).



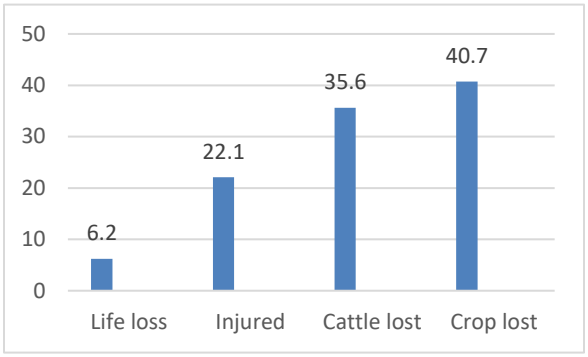


Fig. 4.57 Places to store grain during river erosion Fig. 4.58 Conceived loss during hazardous

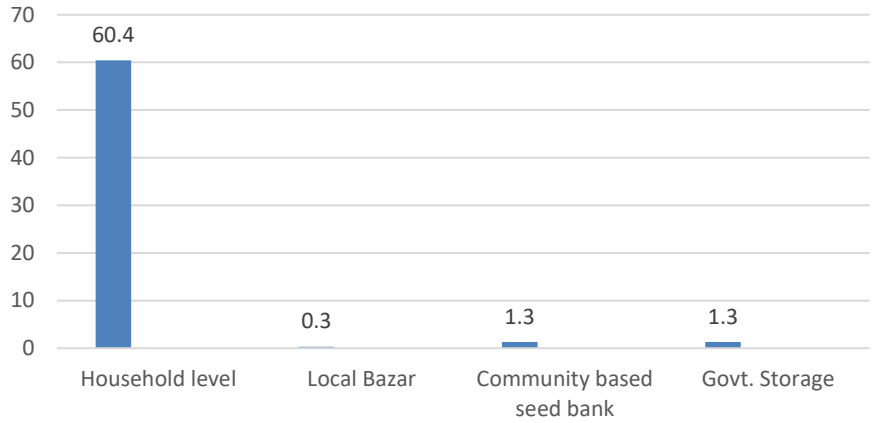


Fig. 4.59 Storage system for you crops during hazards

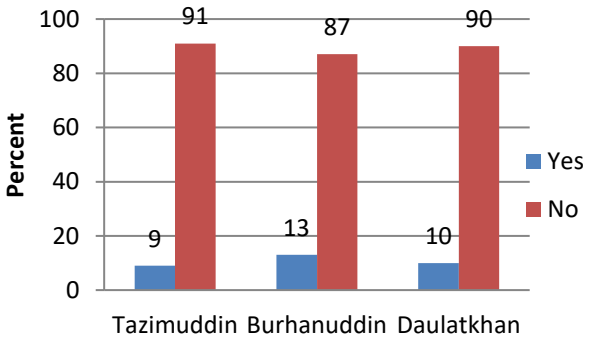


Fig. 4.60 Got assistance from UDMC

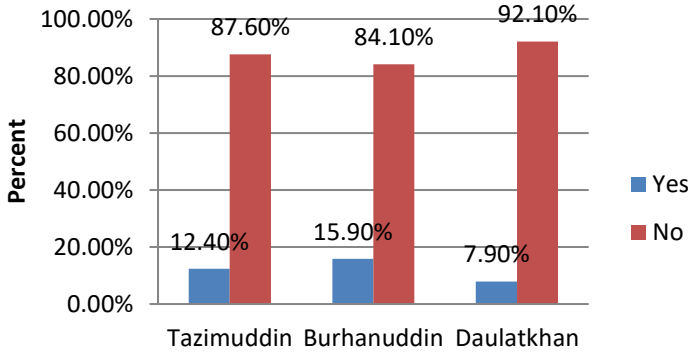


Fig. 4.61 Got assistance from Government services

A higher number of river erosion affected people reported that they did not get relief. This number was more than triple in Tazimuddin upazila (25% and 75% respectively), 65% in Burhanuddin and 58% in Daulatkhan (Figure 4.62). The households who received this relief reported that they received this relief from mainly four sources, such as government, NGO, community and individual (Table 4.10). Among those, the highest one was from government (32%), followed by 12% from NGO. Among the receivers, the highest 92% of the households

received food, 21% cloth, 21% medicine, 14% shelter and only 10% cash money (Figure 4.63). Their satisfaction level on relief operation was varied widely among the households of three areas. The highest numbers of them were moderately satisfied (26% to 34% in three areas), then dissatisfied (19% to 25%) and finally highly dissatisfied (17% to 35%). The highest 35% of the households were highly dissatisfied in Tazimuddin and again 35 satisfied in Daulakhan and 34% moderately satisfied in Burhanuddin (Figure 4.64). The highest number of people (78% to 84%) in all three areas reported that they did not get assistance from government for recovery and construction (Figure 4.65). The households who got this assistance reported that the highest 64% of them received relief (Figure 4.66), 40% food, 17% each family shelter repairing and cash money. The people gave very positive response towards to take permanent measures to stop the river bank erosion as 96% in Burhanuddin, 81% in Daulatkhan and 78% in Tazimuddin say this response (Figure 4.67).

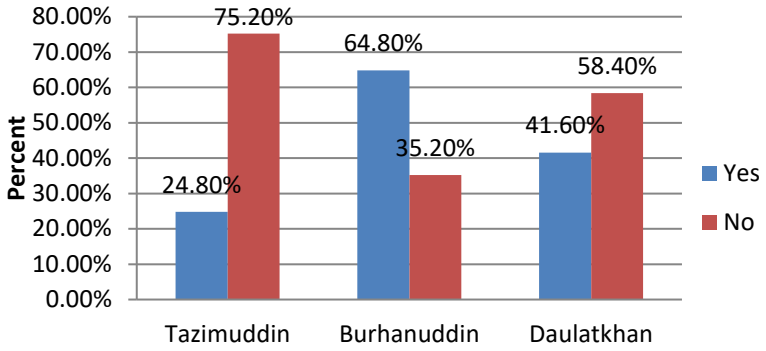


Fig. 4.62 After erosion received any relief

Table: 4.10 Sources of relief

Sources of relief	**f**	**%**
Government	118	71.5
NGO	44	26.7
Community	2	1.2
Individual	1	.6
Total	165	100.0

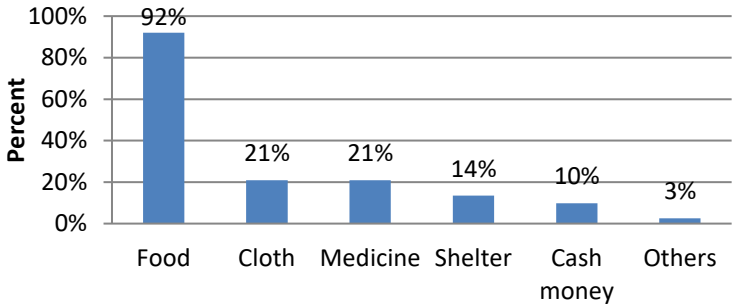


Fig. 4.63 Material received from the Relief Organization (multiple)

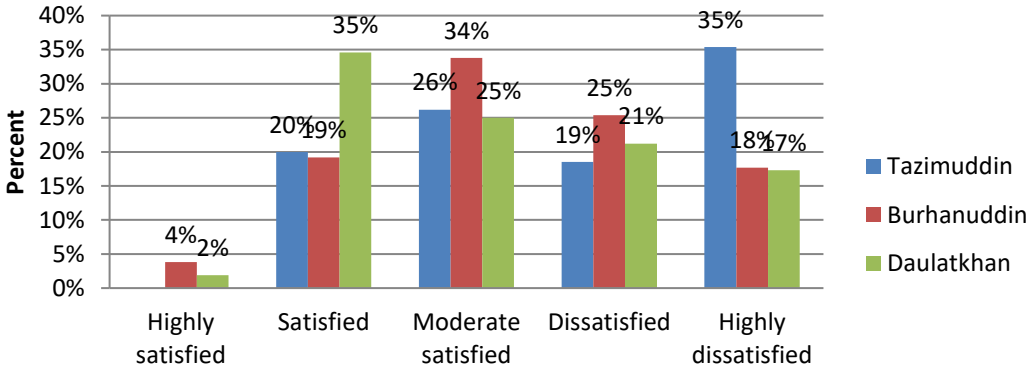


Fig. 4.64 Impression of relief operation

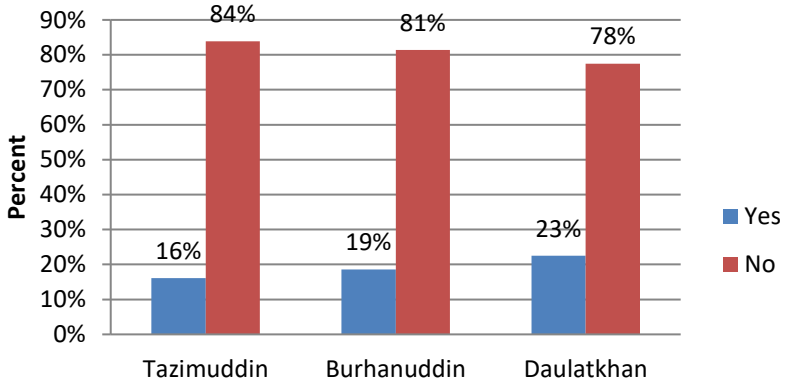


Fig. 4.65 After erosion got assistance from government for recovery and contraction

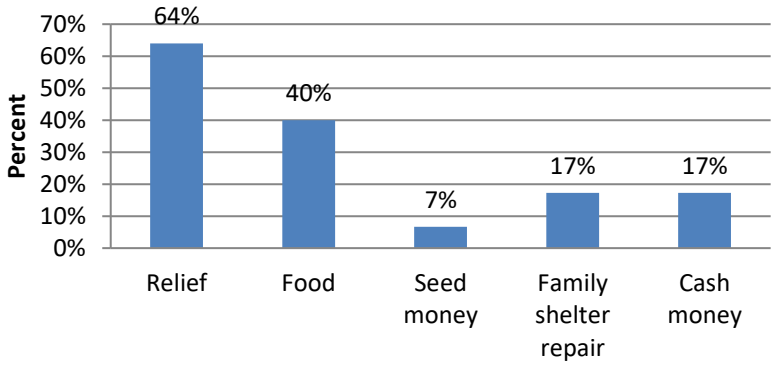


Fig. 4.66 Type of assistant received (multiple)

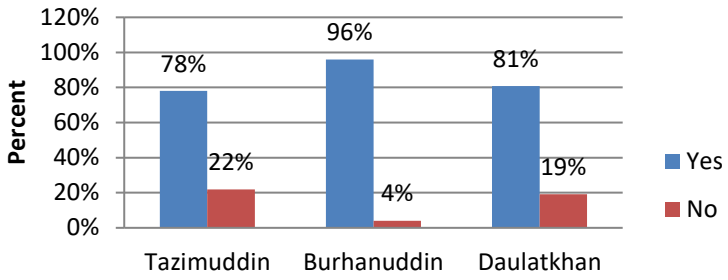


Fig. 4.67 Govt. taken permanent measure for stop erosion

The government took a number of initiatives to reduce displacement by river erosion (Table 4.11). Among those, 80% of the affected households mentioned construction of embankment and 18% tree planation. The highest number of people (33%) were highly satisfied followed by satisfied 29% (Figure 4.68). Only 16 of them were dissatisfied and 8% was highly dissatisfied. From areas wise data, this number did not vary significantly though this number of satisfied people in Daulakhan were found higher which was 40% (Figure 4.69). The people gave a negative impression about NGOs' initiative in this recovery process, where 81% to 88% in all three areas mentioned that the NGOs did not take initiative in the recovery measures (Figure 4.70). Only 10% to 15% of the people gave positive impression about the NGOs' activities. These people mentioned a number of recovery measure such as 71% awareness building, 56% needs assessment, 22% CBO formation and 5% provided seed money (Figure 4.71).

Bibi Rabeya in Daulatkhan told us:

> We never received any relief; it is either after flood or river bank erosion. My family is a supporter of the opposition political party, the administration of the ruling party did not get any service. My family received 30 kilogram of rice during the last ovijan (banned of catching fish) in 2017 that is a half of the total quantity of 60 kilogram per fisherman. This year, we did not get any rice from the government. Even an old age allowance card that is sold Tk. 5,000 by the local government bodies. We do not have this money to buy this card though we should get this free of cost. Many of us did not know about the benefit of this card. We have observed that many people who are not fishermen, but they have got this fishing card.

One old woman in Daulatkhan told us:

> The people who are powerful or have lobby with influential persons get rehabilitation facilities. We sometimes get rice as relief. Most of the time, we have to take

vegetables, hardly eat fish and meat. Most of the morning we have to go without any food.

There is a contradictory opinion about the distribution of relief and assistance and its management. A number of representatives of the local government and members of civil society mentioned in one FGD session:

> We have seen that many of the river erosion affected people are not satisfied with the management and distribution of relief and assistances. One union can provide the fisher card to only 800 fisher men, but the actual need is several times more than this. However, many times, the local government gives half of their assistance so that they can cover more people. On the contrary, the local people always claim that the local government either steals this or deprives them from this assistance. It is also applicable to other kind of assistance such as relief.

One Chairman of a Union Parishad in a FGD session claimed:

> This is true that the affected people who are comparatively powerful or have lobby with the locally influential persons take advantages. We cannot even distribute the khash land to many of them during river erosion.

Table: 4.11 Actions taken by government to reduce displacement

Nature of actions	f	%
Construct embankment	256	79.8
Digging the river	4	1.2
Set up side wall	2	.6
Tree plantation	59	18.4
Total	321	100.0

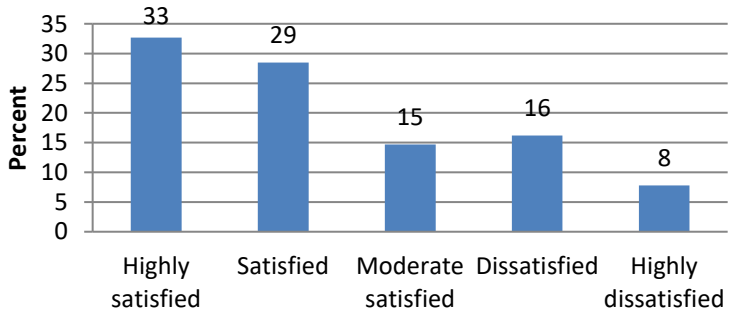


Fig. 4.68 Impression on govt. taken action for stop erosion

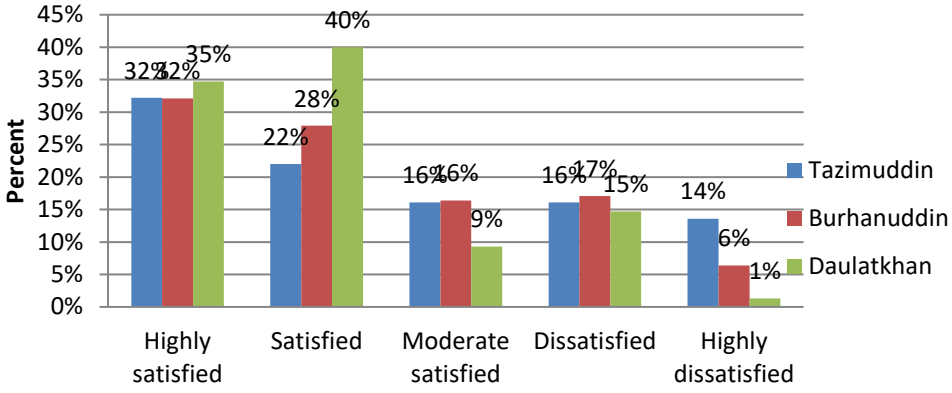


Fig. 4.69 Impression on govt taken action for stop erosion (Area wise)

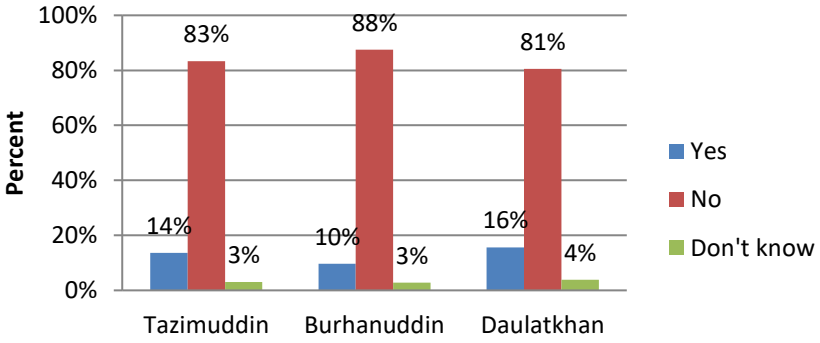


Fig. 4.70 NGO taken recovery measure

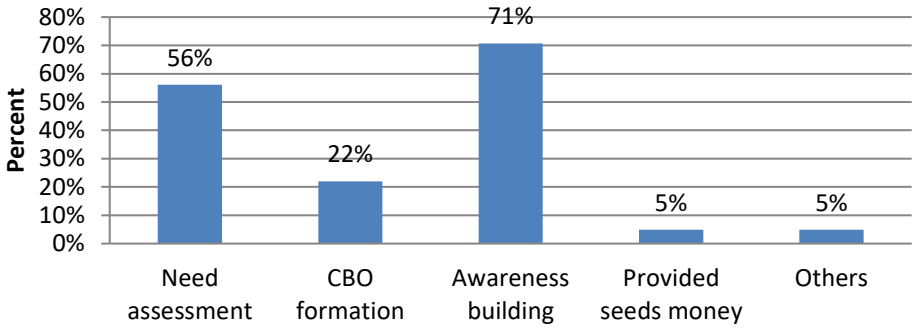


Fig. 4.71 Recovery Measure was taken by the NGO (Multiple)

The affected people followed a number of indigenous coping strategies against river bank erosion though 23% of the households mentioned that they did not take any action (Figure 4.72). Among them, 42% mentioned portable oven, 39% dry food, 34% homestead raising, 23% tree plantation, 18% saving and only 9% first aid box.

In an in-depth case study of Daulatkhan Upazila, Bibi Rabeya (40 years old) expressed:

> During flood, we keep all their fuels, materials, crops, and food under the roof. During river bank erosion, we borrow money from others. At that critical moment, we cannot carry anything without house's tin and fence and we have to buy food and daily necessaries. We make new oven to cook with three bricks and making a whole in the soil. We generally leave our old neighbours and introduce ourselves with a completely new people in the new

riverbank community. Only the Muslim culture and brotherhood help us to make a new residence here. Bibi Rabeya says, 'As Muslim we are sisters and brothers. Therefore, one sister helps to another Muslim sister. One Muslim brother helps to another Muslim brother by giving food, shelter and help'. During riverbank erosion, nobody harasses their daughters because people all are in the same crisis within a community. Sometimes, we have one or two meals in a day.

Most of the households (85% to 94%) in all three areas did not participate in decision making process of recovery and construction planning and programme during river bank erosion (Figure 4.74). Like recovery planning and programme, the highest number of people (86% to 94%) in all three areas also did not participate in the implementation process of recovery and reconstruction planning and programme (Figure 4.75). The household heads were asked to explain the development of decision making process after river bank erosion in their locality, in reply of this, the highest 53% of them mentioned 'no access in this process, 34% mentioned that the decision making process was controlled by the local power politics, 8% limited access and only 5% mentioned fully access (Figure 4.76).

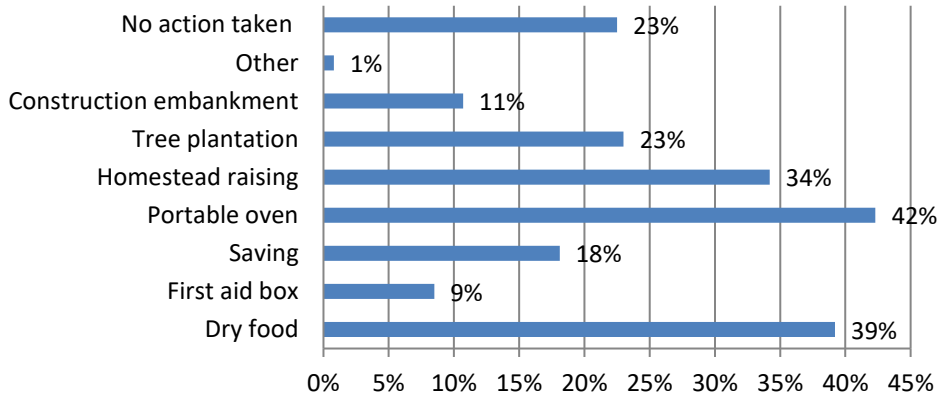
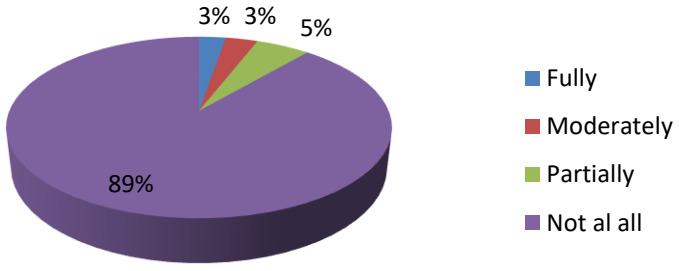


Fig. 4.72 Indigenous coping strategies of HH against river bank erosion (%)

Fig. 4.73 Participate in decision making of recovery planning during riverbank erosion



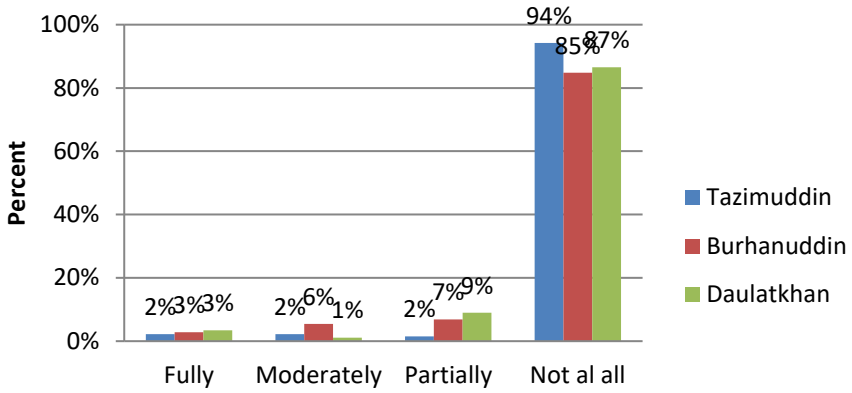


Fig. 4.74 Participate in decision making of recovery planning during riverbank erosion

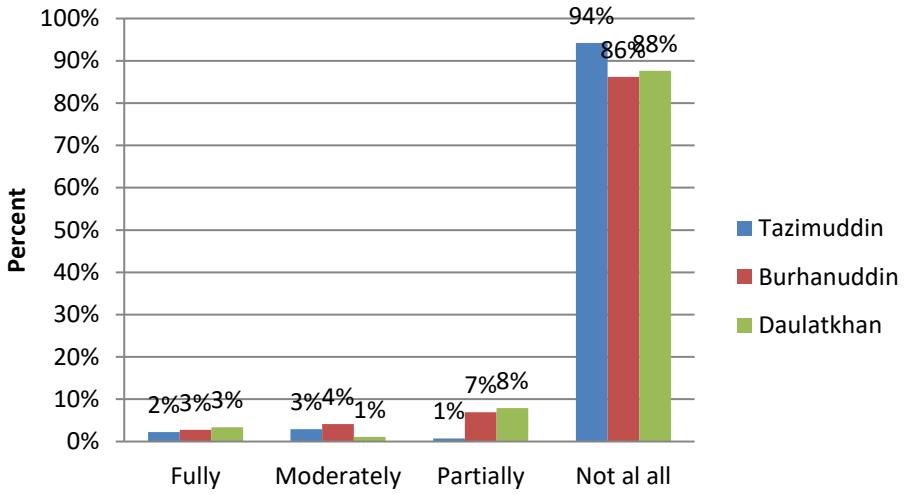


Fig. 4.75 HHs participate recover program planning

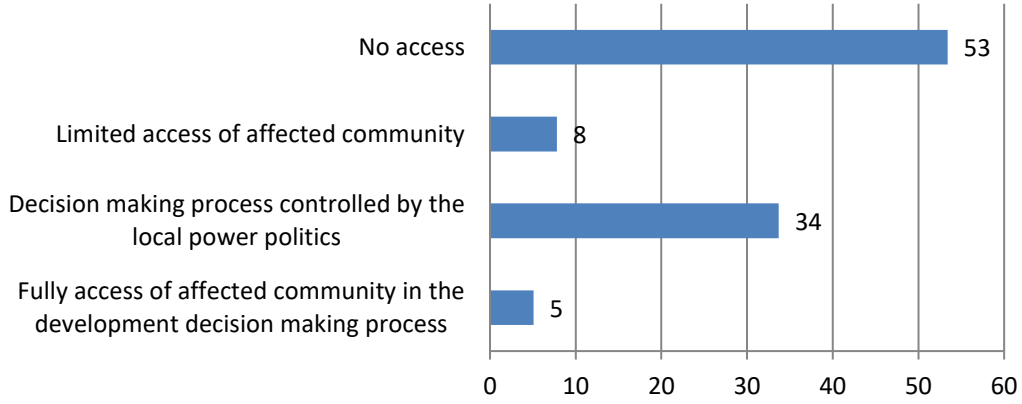


Fig. 4.76 Development of decision making process (%)

Educations and health status

Findings showed that 93% to 99% of the households have school in their locality. But 52% of them mentioned that their local education institutions were fully damaged by river erosion, 12% partially, 7% moderately and 9% did not know between 2013 and 2017 (Figure 4.77). 98% of the household heads mentioned that the government primary/high school was closer to their households (Figure 4.78) The area wise data does not show any big difference except in Burhanuddin, where 82% of people mentioned that their education institutions were fully damaged (Figure 4.7) which was only 7% in Daulatkhan (Figure 4.79). 62% of the household in Tazimuddin mentioned that the river erosion stooped the school, which was 53% in Burnauddin and only 17% in Daulatkhan. However, Daulatkhan was found safest in terms of continuing education activities during river erosion (Figure 4.80). The education activity was stopped due to river erosion in certain time as 37% mentioned 1-2 months, followed by 31% 5-6 months and 14% said above 6 months (Figure 4.81).

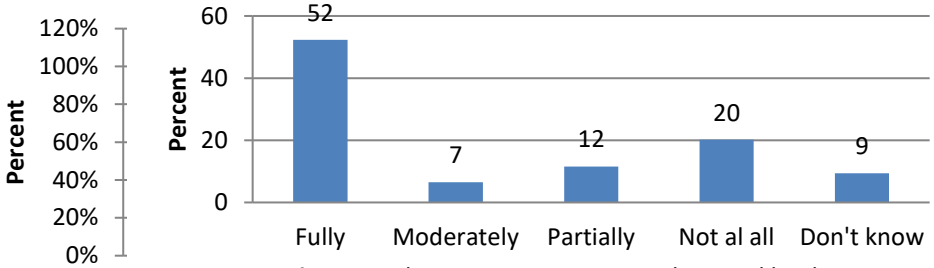


Fig. 4.77 Education institution was damaged by the river erosion between 2013 and 2017

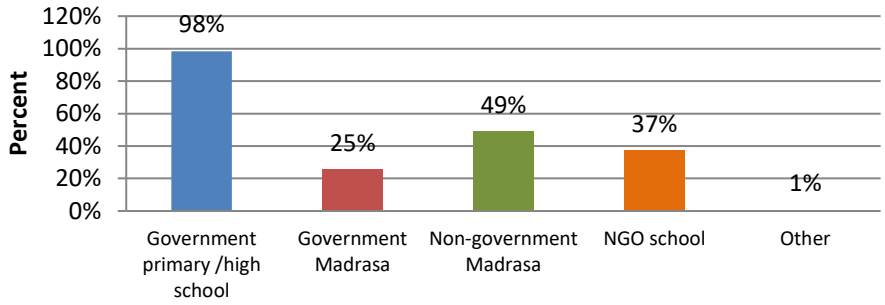


Fig. 4.78 School Near household

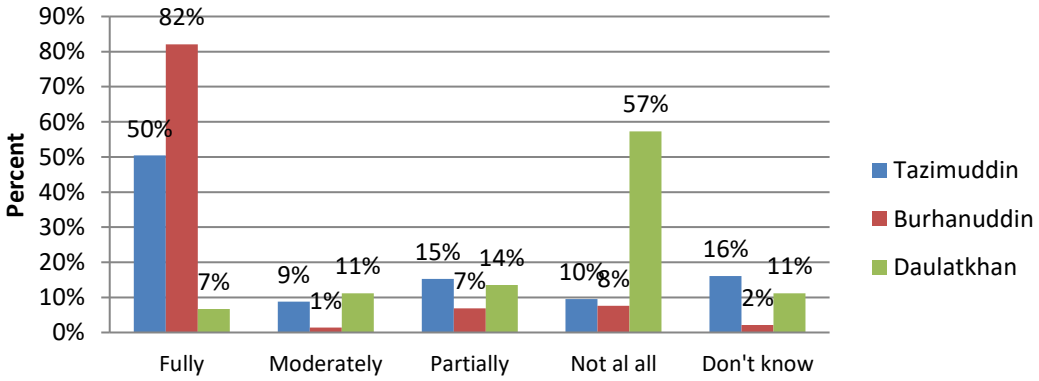


Fig. 4.79 Education institution damaged by the river erosion 20013 - 2017

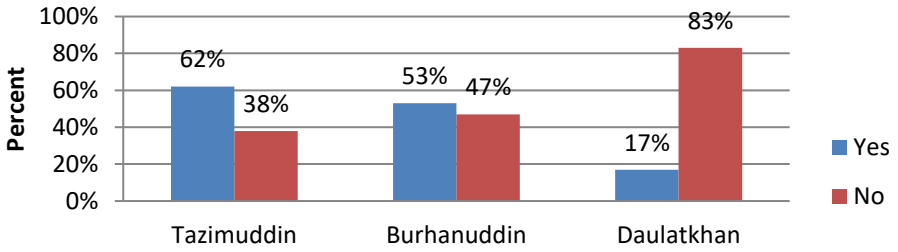


Fig. 4.80 Erosion stopped the schooling of HH children between 2013 and 2017

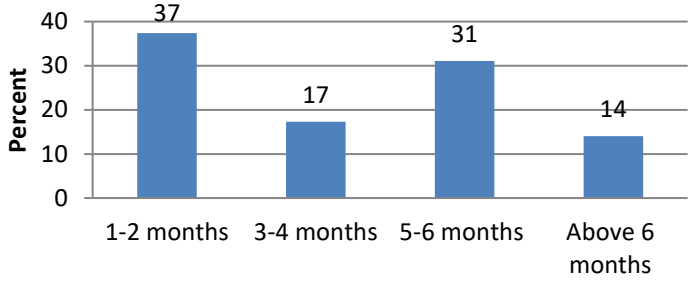


Fig. 4.81 Months education was stopped

The river erosion affected local people suffered by a number of diseases during river erosion (Figure 4.82). 67% of them mentioned cold, 66% diarrhea, 54% dysentery, 47% skin disease, 17% cough, 15% malaria and 14% asthma. These sick people looked for treatment from different sources. The highest 62% of them took this treatment from pharmacy, 47% Upazila Health Centre (UHC), 46% village doctor, 29% religious healer, 29% Union Parishad Health Complex (UPHC), 15% traditional healers, and 13% from the community clinic (Figure 4.83).

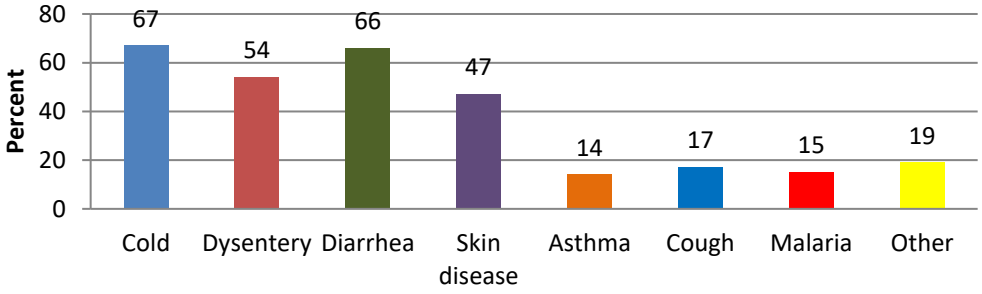


Fig. 4.82 Common disease HH faced last year during river erosion

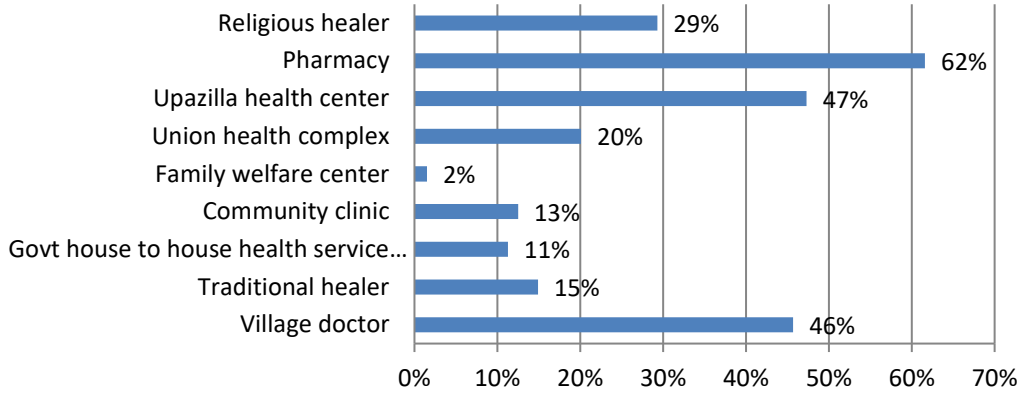


Fig. 4.83 Treatment places of the HHs (%)

Food security

From the data on food security, finding showed that 39% in Tazimuddin, 27% households in Daulstkhan and 21% in Burhanuddin Upazilla did not have three meals regularly (Figure 4.84). The first and last month (Boishakh and Chotra) of the Bangla year were difficult months for the river erosion affected people, where the numbers of two meals and one meal were found higher. The months of Joshtho and Falgun were also bad months for them (Figure 4.85). For example, in Boshakh 23% of the people had two meals and 2% had one meal which were 31% and 4% in Chotra respectively. These numbers were found 9% and 3% in Joshtho and 16% and 1% in Falgun months respectively. In Ashar, 11% of the people had two meals that was not significantly varied in the rest of the months. The number of people who had one meal was found very small and in many months were found zero.

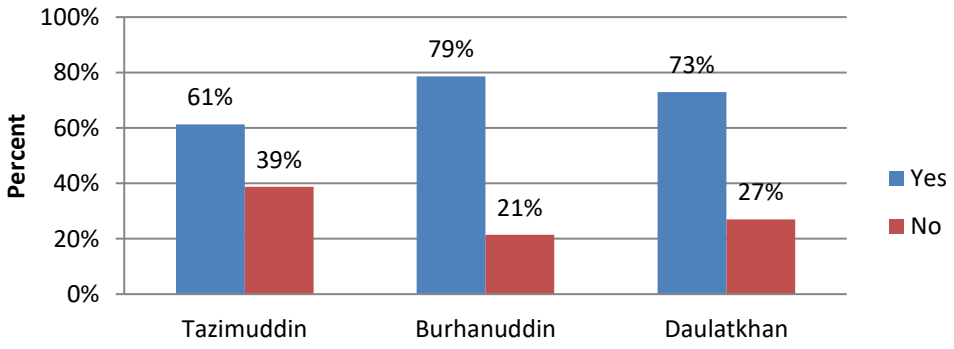


Fig. 4.84 Have three meals a day regularly

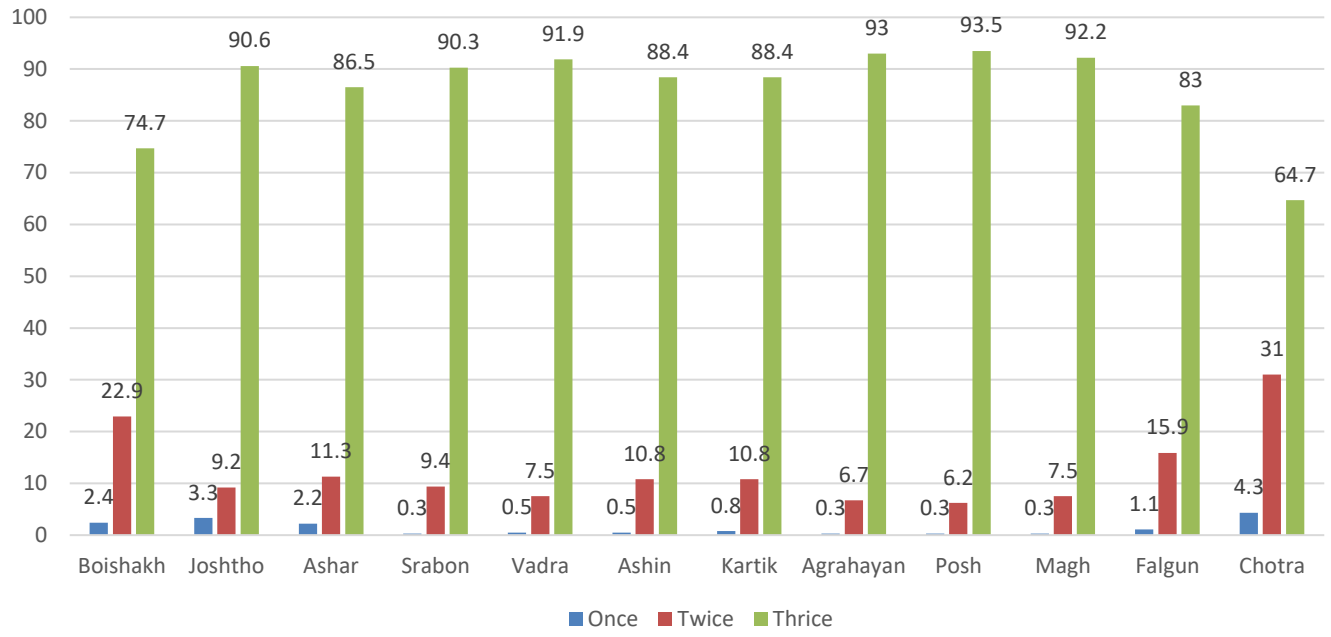


Fig. 4.85 Food Security Profile (status by month)

CHAPTER 5
DISCUSSION

The discussion section covers the findings of the study is strictly related with the main objectives. Many objective of this section is twofold. First, to compare (both similarities and dissimilarities) the studied findings with other previous findings; secondly, to clarify the new knowledge that is originated into the results.

Socioeconomic profile of the river erosion affected people

Results showed that the river erosion affected people are living with low level of education. Their income level was found lower than the national average. Most of the people are engaged either fishing, or fishing labour. Their saving is very low and in many cases, some households' expenditure was much higher than their income as they mostly depend on bank or NGO loans. The households spent more money in food and loan payment. In some cases, they spent a high amount of money to buy their own recurrent materials. They have to pay a high amount of money for dowry purpose. On the other hand, they spent a very little amount of money for their health services and education. Landless is found very high among the affected people except their homestead land which is come to their ownership over verbal approval by the cost of some money. Our qualitative data also show some these socioeconomic scenarios clearly. This similar low socioeconomic findings are compared with a significant number of studies. The overall socioeconomic findings show that the riverine areas of Bangladesh have been identified as among the areas 'most liable to famine' (Currey, 1979: 269) and as home to the poorest, most marginalized and vulnerable communities in the country (DFID, 2002). The riverbanks and islands in river courses are found regularly subjected to floods, massive and rapid erosion, and siltation. Consequently, people living in these areas are said to 'suffer from multiple and very particular forms of vulnerability rooted in the threat of seasonal flooding and erosion' (Brocklesby and Hobley, 2003). In a study, Lein (2009) found the three main problems the affected people experienced during periods of exceptional floods were, in ranked order, transport problems, water in homestead areas and lack of employment and/or income.

Housing, latrine, water and sanitation

The study showed that though the river erosion affected people had self-ownership of their houses and highest of them made their houses own earning, but their housing condition is poor. Both data sets exposed that their houses had no facilities such as furniture, electricity, water supply, sanitation and hygiene. Their houses are closed to the rivers and had high risk of hazards such as further river erosion, tidal and coastal erosion. Most of them had no own water sources for drinking, cooking, and washing. Most of them highly depend on community and government arrangement. High number of people were not satisfied on the arrangement of these sources. Regarding the safety issue, these were found high risk for the females. These findings are supported by a number of studies. For example, Uddin and Rahman (2011) reported that poverty, unemployment, job shifting and indebtedness are common scenarios in this belt of erosion. Rogge and Elahi (1989), Lima et al. (1991), Keya and Harun (2007), Haque (1997), Paul and Islam (2015), Islam (2018), Islam and Shamsuddoha (2017), Islam and Hasan (2016), and Islam and Hossain (2014) found that bank erosion severely impacts on the vulnerable groups of the society and especially women. It has been noted that displaced women

have higher level of perceived stress than the non-displaced counterpart (Lima et al. 1991; Keya and Harun 2007).

Vulnerability

The study collected a wide range of data on the types, nature, causes, and socioeconomic impacts of vulnerability on the livelihoods of the river erosion affected people in the Bhola District. The study categorically collected data on the economic and diverse social and psychological vulnerabilities they are facing. Data showed that on an average every household had experience minimum one time of river erosion, where 50% of their erosion was catastrophic. Between 2013 and 2017, 36% of the households mentioned that their agricultural land was affected by river erosion and average 56.37 decimal per household land was affected by river erosion and its economic value was Tk. 1,85,885. On the other hand, 58% of the households mentioned that their homestead was affected by river erosion on that time which was average 28.48 decimal per household and its economic value was Tk. 3,40,094.

The study explored vivacious information on different psycho-social, cultural and social dignity related vulnerabilities from the river erosion affected people by using Likert 7-scales. The overall data showed that all of the respondents were strongly agreed on different aspects of the psycho-social and social dignity related vulnerabilities on their livelihoods. Around 70% of the households mentioned that they were strongly agreed on two aspects such as 'river bank erosion has increased poverty in our community river' and 'river bank erosion has forced the displacement of the household' followed by other issues such as 'we feel insecurity because of river bank erosion' (64%), we feel helpless during river bank erosion' (63%), 'many schools and social institutions were damaged by river bank erosion' (63%) and 'participation of river erosion victim in recovery process has controlled by the political institutions and local power politics' (62%). The food insecurity, breaking socio-cultural bondage and networking, decrease social esteem, and problems of destitute people, and displacement were mentioned by around 50% to 59% people. The number of disagree and strongly disagree and even on 'no comment' households were found very low. Data showed that 17% households were strongly disagreed on 'many people in our locality were involved illegal practices due to river bank erosion', followed by 16% on 'child marriage has increased due to river erosion', and 15% on 'my household occupation pattern has changed due to river bank erosion' who were strongly disagreed with this comment.

The study presented bagged a number of comments about the feelings and sufferings of the river erosion affected people in the qualitative analysis. This qualitative analysis revealed that the vulnerability particularly psychosocial vulnerabilities affected on different people differently. The study presented a number of case studies, verbatim and comments of the FGDs and KIIs on different aspects of these vulnerabilities. It includes social inequality, social networking, social bondage, happiness, mental stress, child labour, forced displacement, neighborhoods, gender violence, social distance and insecurity, poverty, NGO services, and political perspective and so on. The study also presented a number of case studies how river bank erosion affected on the aged people, widows, pregnant mothers, children and disabled people. The contextual value of these findings are so impressive and significant to understand the real situation of the affected communities and their livelihood patters.

At the beginning of this qualitative analysis, the study presented an overall situation of health, hygiene, sanitation and family planning issues of the affected communities. Findings showed that the river erosion affected people have no personal hygiene and the sanitation system is totally erupted and most of the affected people are using open or hanging latrines. The environment is completely polluted where people are living with an utterly unhygienic condition and suffering different diseases such as cholera, diarrhea, and other contaminated diseases. There is no personal safety and security. The social dignity of the people is seriously low. Family planning issue is totally ignored. The study presented a case study of Abdul Malek (60 years old). This case showed how he was separated from his family but he cannot be separated from rivers as there is no alternative working option except fishing labour. The case of Bibi Rabeya (40 years old) showed how her family was trapped in the rivers' life because of financial and job insecurity outside the rivers. In another finding, the study netted a social picture how the richer people take advantage from the looser (affected) people who looked help from them during river erosion. The case of a 70 years old widow Fazilat gives us more clearer picture how the people are trapped on the river who accused to the rivers: 'Oh river be kind to us, do not destroy our inherited house, our homestead land'. We saw another middle aged women who are passing days without food and daily necessities who lost her husband during river erosion. In another case of Zainal Abedin (55 years old) showed how he is playing hide and seek with rivers which can be compared with another finding of Islam and Shamsuddoha (2017). The study presented a real scenario of widow allowance of Monju Begum (35) who is not entitled to get this as she is not enough age as the terms and conditions of this allowance. The study also gives a lifelike picture about the process of becoming child labour who are not going school rather involving work which is their requirement during river erosion. The case of Zakir Hossen Chowdhury rather gives more sensitive oicture on the devaluation of social dignity by river erosion. Now he is passing with his untold pains where he is hiding his family identity because it is worthless now. The case of Monwara (65) gives more fervent picture about the social dignity of the river erosion affected people. She had six acres land but she lost everything due to river erosion and she is now working as a maid servant with her daughter to a neighbor who was a regular worker in her household before river erosion. The study also narrated some scenario how the girls are sorrowed by sexual harassment due to their low financial and social dignity.

The presented both quantitative and qualitative findings on migration and displacement due to river erosion vulnerabilities. Analysis showed that 95% of the households had to displace due to river erosion, 35% had to displace 1 to 2 times and 32% of them 3 to 4 times, 44% of the households lastly displaced during 2013 to 2015, even 19% displaced recently (2016 to 2018). For many households, access to homestead land creates the greatest problems. Even land-rich households may have problems finding suitable new plots to set up house when their homesteads are lost to erosion (Lein, 2009). The erosion affected households mentioned multiple causes behind of their displacement. Among those, 83% to avoid river erosion in future, 36% avoid inundation, 34% loss of homestead, 27% to protect household from cyclone and 24% to avoid water logging. It found that 30% of the households were displaced to the embankment, 22% to relatives' hose and 16% to the government and non-government's shelters. Only 19% were displaced to their own land in another places. Below 1% of the affected households displaced at school and adjacent villages. Out of this 54% of the households had to thinking to do a plan displacement while 70% of them mentioned to avoid

river bank erosion further, 42% to avoid disasters, 33% to avoid inundation and 19% to avoid water logging, and 32% of the households wanted to displace for better life and 9% each for lack of employment and influence of power structure.

The overall of these findings can be compared with a number of previous studies. For example, Morton et al. (2008) note that climate change induced extreme weather events significantly affect displacement in three different ways in Bangladesh. First, the effects of warming and drying in some regions reduce agricultural potential and undermine 'ecosystem services' such as the availability of clean water and fertile soil. Second, heavy precipitation causes flash or river floods in tropical regions. And finally, the sea-level rise permanently destroys extensive and highly productive low-lying coastal areas that are home to millions of people who have to relocate permanently.. Basar, Baki and Gan (2012) Population displacement is the foremost consequence of the bank erosion. They reported that as one of the largest braided rivers in the world, the Jamuna River (JM) of the lower Brahmaputra regularly undergoes significant erosion, causing major bank line migration, making thousands of families homeless and sizeable land loss every year, e.g., the dynamic nature of Jamuna causes great suffering to the people living along its course and on its islands. Lein (2009) mentions that popular assumption is that people live there only because they have no other options; that increasing population pressure, unequal access to land, lack of employment opportunities and poverty force marginalized people to settle in such high-risk areas such as the active floodplains of Bangladesh (Burton et al. 1993). In their book At Risk, Wisner et al. (2004: 234, Figure 6.3) too claim that such 'root causes' as unequal access to land and rural power structures lead to the 'breakdown of rural economy and exodus of losers to towns, embankments and chars'. In short, economic and social marginalization leads to spatial marginalization. Islam and Hossain (2014) mention that more than 60 % households migrated from the chars for two major purposes—seeking just an employment (57 %) and higher wage rate (31 %). Wellmeyer et al., (2005) and (Li et al., (2007) mentioned that activities that harness and manipulate the flow of water for the benefit of humans have increased dramatically with the increase in global population, with a range of consequences including channel pattern alteration, increased flood risk, navigation constraints and changes to aquatic and riparian ecosystems.

Islam and Shamsuddoha (2017) and Islam (2018) argued that such movements include internal displacement and international cross-border movement, and may be permanent, short-term, seasonal or circular in nature. They added that in Bangladesh, it is seen that people in a good financial condition (e.g. cash capital) and with resources (e.g. land and good housing facilities) migrate in a planned way, while those who are poorer, especially women, children, the elderly and disabled people, have fewer options for either planned or forced migration. Adger (2010), Islam and Shamsuddoha (2017), and Islam and Khan (2018) added that climate change leads to slow-onset changes in climatic and environmental conditions (e.g. sea-level rise, land degradation and loss, declining abundance of fish, contamination of water resources and degradation of coral) that contribute to loss of important environmental amenity and livelihoods. Slow-onset environmental changes can be a proximate factor in long-term movement away from a place of origin. Forced displacement is likely to occur as environmental changes and extreme climate events undermine peoples' ability to live in their places of residence (Islam and Khan, 2018).

Livelihood options

The river erosion affected people are highly depended on the natural resources for income and consumption. They were engaged in different types of activities, 85% catching fish, 22% crop cultivation and the rest engaged in livestock rearing, and shrimp larvae. Main income related livelihood options were found fishing labourer (47%), day labourer (44%), catching fish own (33%), crop cultivation (15%), small business (14%) and livestock rearing (10%), and highest of them were not satisfied with their current livelihood options as they faced a number of problems such as lack of capital (52%), lack of knowledge about climate adaptive livelihood options (44%), lack of skills in managing livelihood options (42%), plash food (41%), damage land due to salinity, and water logging (34%). The study showed that there were very limited options to change their livelihoods in the time between 2013 and 2018. Due to multiple loses 93% of the households members had to engage for income during river. Although many respondents considered settling on the mainland, they saw limited scope for this mainly because of a lack of land and/or the high prices of land on the mainland: to sell off char land to acquire land on the mainland was not a viable option for most (Lein, 2009).

Coping strategies and resilience

The study showed that the people faced a number of disasters in their communities that include salinity, cold wave, tidal surge, cyclone, and flash flood. More than half of the people did not take any pre-caution against hazards of these disasters. They took a number of pre-cautions such as ready dry food, ready of moveable woven, savings, fire wood, tiding house, plinth rising, and tree planation; and a very few households (only 4%) mentioned that they had first aid box. Nearly three quarter of them stated at land protected embankment. Only 5% of the people of the study areas received training on disaster management, and 14% had idea about Disaster Management Committees (DMCs). 52% of the households tried to reduce cost during river erosion. The study showed that during river erosion, 28% went to the shelter centres, 15% took shelter at their relatives' house and 19% stayed at their own houses, and 15% had to stay at embankments of the rivers. The households followed a number of ways to reduce their cost during river erosion such as 87% took less food, 63% had to borrow money from different sources, 44% cut down their clothing and other costs, and 31% borrowed food from relatives and neighbours. They conceived a number of losses by river erosion such as crop loss (41%), cattle loss (36%), injured (22%) and life loss (6%).

The study areas were found very unsafe and inefficient to the river erosion affected people in terms of their shelter, places to keep their cattle and grain. The study captured a number of interesting qualitative findings about the government and nongovernment services, its management, recovery planning and participation of the disaster affected people in the construction planning and programmes with the quantitative analysis. The shortages of services in one hand, and quality of services on the other make those vulnerable people so disgraceful and dishonorable. The mostly significant finding was that the NGOs' response to the river erosion affected people was found very negligible as 81% to 88% in all three areas mentioned that the NGOs did not take any initiative in the recovery measures. The study showed that there were taken a number of recovery measure such as 71% awareness building, 56% needs assessment, 22% CBO formation and 5% provided seed money. On the contrary, the affected people followed a number of indigenous coping strategies against river bank erosion such as 42% mentioned portable oven, 39% dry food, 34% homestead raising, 23%

tree plantation, 18% saving and only 9% first aid box. 85% to 94% of the people in all three areas did not participate in decision making process of recovery and construction planning and programme; and 86% to 94% did not participate in the implementation process of recovery and reconstruction planning and programme. The most stunning finding was that more than half of the people had no access in decision making and 34% mentioned that the decision making process was controlled by the local power politics.

Food security

The first and last month (Boishakh and Chotra) of the Bangla year were difficult time for the river erosion affected people, where the numbers of two meals and one meal were found higher. The months of Joshtho and Falgun were also bad months for them. For example, in Boshakh 23% of the people had two meals and 2% had one meal which were 31% and 4% in Chotra respectively. These numbers were found 9% and 3% in Joshtho and 16% and 1% in Falgun months respectively. In Ashar, 11% people had two meals that was not significantly varied in the rest of the months. The number of people who had one meal was found very small and in many months were found zero. This finding is bit different than the finding of Islam and Hossain (2014) who calculated the food security in the river erosion char land. They found the months of Vadra and Ashhin (August and September) were difficult months where the lower number of people could afford three meals. Still these numbers are the main challenges towards the Sustainable Development Goals (such as Goal 1: No Poverty and Goal 2: Zero Hunger). Rahman et al., (2016) provides a solid explanation of this. They argue that the limited available land, reduction of land fertility, river bed siltation due to upstream erosion, unavailability of water for irrigation, destruction of standing crop, the increased cost of cultivation and unfavourable climatic factors for cultivation are creating pressures on agricultural land, water availability and ecosystem services. All these drivers have changed the agricultural production and livelihood pattern of affected communities and put forth problems to food security and socio-economic conditions.

The findings of the study do not find any big difference across three areas in the study location on different components such as socioeconomic conditions; housing, latrine, water and sanitation; vulnerability; migration and displacement; livelihood options/choices; coping strategies and resilience; and food security. The most esteeming is that this is a broad based field study which apprehended almost all perspectives of the river erosion affected people in Bhola District. Based a mixed method, the study findings show the interspersing and intertwining issues from two ways- qualitative and quantitative demeanors. As a result, the readers can interdepend their understanding from both the ways. It is argued that many aspects of the vulnerabilities, livelihood options, coping strategies and resilience were engrossed and envisaged from qualitative manners. This approach helps to find the socioeconomic consequences of the topic vigorously. From this perspective, our understanding from the study findings is that as unintended consequences, the inherent tendency and possibility to classify and label groups of people and societies as vulnerable, may actually serve to reinforce popular and ingrained prejudices, negative stereotyped images and dubious explanations that further their social marginalization (Lein, 2009). In this regard, we also understand that a livelihood is ‘sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base’ (Scoones (1997).

This study findings contributed a new knowledge on different areas within the broad range of the research objective. The study is not claiming that the findings unfold the knowledge which was not discovered before, but the superb point of this study is that the study unfold a number of interesting knowledge on the vulnerabilities, migration and displacement, coping strategies and resilience in the Bhola District, which is rarely found in other social sciences research. In addition, there are plenty of studies that may cover many of these aspects but most of them look this issue either from purely scientific manner or sometimes within the limited scope from social sciences perspective. However, in terms of the coverage of the contents and aspects, this study is more comprehensive and broad, where the researchers, policy makers, disasters mangers, economists, NGO workers and academics can get good learning about the topic.

CHAPTER 6
CONCLUSIONS AND POLICY IMPLICATIONS

Conclusions

Based on a mixed method approach this study explored both quantitative and qualitative data on vulnerability, social dignity, and livelihood options/choices of three rural communities (Tazamuddin, Burhanuddin and Daulatkhan Upazillas) of the Bhola Distric in Bangladesh. The study used the Sustainable Livelihoods Framework (SLF) and examined how different drivers such as demographic, social, economic, political and environmental river erosion impacts on their livelihoods resources and lead them for displacement and migration and a series of vulnerabilities. This study investigated the types and nature of livelihood options/choices and coping strategies and resiliencies the river erosion affected people followed. The study also looked the food security over twelve months' time during river erosion.

The study revealed that the loss of land to river-bank erosion is a crucial problem in the Bhola District. Both wage earners and non-wage earners are impacted due to fewer employment opportunities leading to social poverty and low livelihood status. Health and wellbeing is a crucial enabler for efficient farm and non-farm activities and determines individuals' and households' ability to achieve their livelihood objectives. Under-nutrition due to insufficient food and lack of health facilities impact on an individual's ability to perform income and non-income related activities ultimately increasing vulnerability and causing a burden on the households and communities. This research found that the livelihood conditions of the study households of all three unions in three upazillas tend to follow a vicious circle from low livelihood opportunities to increasing poverty. Due to their existing poor livelihood conditions, their opportunities to earn income (at both agriculture and non-agriculture) become limited. This limited income also has knock-on impacts on household food intake since the main source of household food supply is either from their daily wages or social safety net. Land loss due to river-bank erosion curtails food production and income generation, and low income reduces household purchasing power. This study has shown that low livelihood status is also a driver of river bank erosion driven vulnerabilities and intensification of the hydrological cycle will impact more severely on riparian communities. The lack of livelihood options and poor household conditions together contributed to the less ability to cope with the post-disaster vulnerabilities. The low level of participation of the river erosion affected people on disaster construction, planning and pragrammes created a low level of their community resilience which further increase vulnerability in future which we say cycle of disaster vulnerability and livelihoods.

Despite a number of limitations such as bad commination system at study areas, lack of data on the particular communities, and environmental constraints, still the research team believes that this study presented important findings on this particular issue. It is hoped that the findings would be important guidelines in policy implications particularly on the existing legislatives and policy documents. Findings would be important to the disaster managers, Ministry and Department of Disaster Management, related ministries and directorates, NGO workers, voluntary organizations, local governance representatives and overall local community people.

Policy implications

There are a number of national planning, programmes and policies such as VISION 2021, National Planning for Disaster Management (2016 – 2020), Bangladesh Climate Change Strategic Action Plan (BCCSAP) 2009, Seventh Five Year Plan (2016-2020); acts such as Disaster Managemnt Act 2012; global development such as the Sustainable Development Goals (SDGs); and international agreements such as the Paris Climate Change Agreement 2015 and Sendai Framework for Disaster Risk Reduction (SFDRR) (2015-2030), etc. are working which are meticulously related with the study objectives and findings.

The VISION 2021, National Planning for Disaster Management (2016 – 2020), Bangladesh Climate Change Strategic Action Plan (BCCSAP) 2009, and Seventh Five Year Plan (2016-2020) are very significant documents in Bangladesh. All of these documents have specific missions and visions, where the government has initiated a number of programmes towards environment and poverty, environment management, reduction of the overall risks of disasters, effective implementation of post disaster emergency response, protection of displacement and migration due to disasters including river erosion, rehabilitation and recovery measures, and increasing food security and community resilience. The VISION 2021 includes a number of aspects which include poverty eradication and protection of disaster affected people though social safety net programmes. This VISION argues that climate related disasters negatively impacts on the people's dignity and creates psychological problems. However, it suggests to follow a holistic approach which requires local level planning involving Union Parishad (UP).

VISION 2021

Addressing challenges of poverty reduction

The diverse underlying causes of poverty in Bangladesh include vulnerability, social exclusion, and lack of assets and productive employment; although the main symptom is often hunger. The extreme vulnerable poor can potentially lift themselves out of poverty with appropriate short to medium-term support. A sharp rise in inequality would not only undermine the impact of growth, but may also threaten social cohesion and breed instability and discontent. Both poor and non-poor families are **vulnerable to shocks (e.g. natural disasters**, health problems) that can return them quickly into extreme poverty. There are four major concerns that the current rate of progress in reducing extreme poverty may not be maintained: (1) slowdown in the global economy together with domestic factors; (2) growing population density is likely to force more of the poorest people to live in the most vulnerable areas; (3) **climate change will exacerbate the vulnerability of poor people to environmental shocks, with the predicted increase in extreme climate events; and (4) demographic and social changes may further increase vulnerability and social exclusion.** Risks and vulnerability are mainstream problems in the lives of the average Bangladeshi and are recognized as such by governments, individuals and communities. Safety Net Programs to address risk and vulnerability have been an integral part of the anti-poverty strategy of the governments and will remain so for the next decade. **Risk reduction and social protection are important not only in themselves but also because an unaddressed risk atmosphere carry negative psychological consequences for the livelihood initiatives of the poor and for community efforts at social cohesion**. **Effective policy initiative based on a holistic approach to social protection will require a sharper profiling of risks, old and new. These include disasters, anticipated risks such as monga and seasonal poverty, public health risks associated with the urbanization process, social ills such as dowry, erosion of family-based safety nets and emergence of new vulnerable groups such as the elderly and the disabled** which may give rise to new categories of poor whether in terms of worker displacement, **livelihood losses or victims of environmental disasters.** The potential of local government bodies, particularly the **Union Parishad, to coordinate** a streamlined institutional strategy needs to be actively explored

National Planning for Disaster Management (2016-2020)	**Bangladesh Climate Change Strategic Action Plan (BCCSAP) 2009**
The disaster management vision of Bangladesh is to **reduce the risk of people, especially the poor and the disadvantaged**, from the effects of natural, environment and human induced hazards to a manageable and acceptable humanitarian level and to have in place an efficient emergency response management system. The main mission is to achieve a paradigm shift in disaster management from conventional response and **relief to a more comprehensive risk reduction culture, and to promote food security** as an important factor in ensuring the resilience of communities to hazards. The plan has three **core goals such as saving lives, protecting investments, and effective recovery and rebuilding**. **Bangladesh has taken a holistic approach towards disaster management**, where emphasis has been given to working together with all stakeholders to build strategic, scientific and implementation partnerships with all relevant government departments and agencies, and other key non-government players including NGOs, academic and technical institutions, the private sector and donors. **Flood is an annual phenomenon generally affecting 30 per cent of the country, but up to 70 per cent in extreme years**. Flood-related fatalities are decreasing, but **economic losses have been increasing over the years**. The government has been developing and implementing **various measures to better equip the country to deal with floods. Important initiatives include the flood action plan, flood hydrology study, flood management model study, national water management plan, national water policy, flood early warning study and construction of flood embankments and flood shelters**.	The climate Change Action Plan is built on six pillars: 1. Food security, social protection and health to ensure that the poorest and most vulnerable in society are protected from climate change and that all programmes focus on the needs of this group for food security, safe housing, employment and access to basic services, including health. 2. Comprehensive disaster management to further strengthen the country's already proven disaster management system to deal with increasingly frequent and severe natural calamities. 3. Infrastructure to ensure that existing assets (e.g. coastal and river embankments) are well-maintained and fit-for-purpose and that urgently needed infrastructure (e.g. cyclone shelters and urban drainage) is put in place to deal with the likely impacts climate change. 4. Research and knowledge management to predict the likely scale and timing of climate change impacts on different sectors of the economy and socioeconomic groups. 5. Mitigation and low carbon development to evolve low carbon development options and implement these as the country's economy grows over the coming decades and the demand for energy increase. 6. Capacity building and institutional strengthening to enhance the capacity of government ministries and agencies, civil society and the private sector to meet the challenge of climate change and mainstream them as part of development actions.

On the other hand, the National Planning for Disaster Management (2016 – 2020) also argues to adopt a holistic approach and covers a number of areas such as reduce the risk among poor people, adopt a comprehensive risk reduction culture, promote food security, saving lives, effective recovery and rebuilding, developing and implementing various measures to better equip the country to deal with floods. Important initiatives include the flood action plan, flood hydrology study, flood management model study, national water management plan, national water policy, flood early warning study and construction of flood embankments and flood shelters.

Bangladesh has developed a long-term climate change strategy e.g. BCCSAP initiated six pillars to address the development needs of society while building climate resilience. These

include food security, comprehensive disaster management, infrastructure development, research and knowledge, mitigation, capacity building through institutional strengthening. On the other hand, the 7th Five Year Plan (2016 to 2020) emphases the growth and poverty reduction and suggests some measures for water and sanitation and environment and climate change. This plan argues that the overall environment and climate change is closely related with the country's overall development. The plan also enhanced for creation of alternative livelihoods and building resilience for community to lessen anthropogenic pressure on resources.

7th Five Year Plan (2016 to 2020)

Growth and poverty reduction

The 7th Plan seeks to reduce poverty rate to 18.6% and extreme poverty to around 8.9% by FY20. Along with growth, the 7th Plan will emphasize human development, social protection and social inclusion as essential elements of a comprehensive poverty reduction strategy.

Water and Sanitation

- Safe drinking water for all
- Proportion of urban population with access to sanitary latrines to be increased to 100 percent
- Proportion of rural population with access to sanitary latrines to be raised to 90 percent.

Environment and Climate Change

The main objective of the Seventh Five Year Plan is to ensure environmental sustainability through conservation of natural resources and reduce air and water pollution. The Seventh Plan has stressed the need to take into account environment, climate change adaptation and mitigation in a broader development context. In this regard, this Plan recognizes climate change as an added challenge to reduce poverty and environmental degradation. Thus, the Seventh Plan focuses on key strategic element for natural conservation with increased forest coverage with appropriate tree density, water bodies and protected areas and maintenance of natural resource quality and wildlife at a desired level. Creation of alternative livelihoods and building resilience for community to lessen anthropogenic pressure on resources will be enhanced. Relevant programmes for environmental and climate change capacity building at local and national level will be the main interventions of this Plan.

Disaster Management Act, 2012

The objectives of the Act are substantial reduction of the overall risks of disasters to an acceptable level with appropriate risk reduction interventions; effective implementation of post disaster emergency response; rehabilitation and recovery measures; provision of emergency humanitarian assistance to the most vulnerable community people; strengthening of institutional capacity for effective co-ordination of disaster management involving government and non-government organisations, and establishing a disaster management system capable of dealing with all hazards for the country. The Act is intended to help in promoting a comprehensive disaster management programme upholding the all-hazard, all-risk and all-sector approach where risk reduction as a core element of disaster management has equal emphasis with emergency response management with greater focus on equitable and sustainable development.

Climate Change Trust Act, 2010

The Trust shall have the following aims, namely:

(a) to make necessary action plan for capacity building for adjustment of the people or groups of people of the affected and risky areas resulting from climate change, upgrading their life and livelihood and facing the long term risk, and to take measures for implementation thereof;

(b) to take measures for adaptation, mitigation, technology development and transfer, capacity building and funds for facing adverse effect of climate change on man, biodiversity and the nature.

In Bangladesh, there are two acts such as the Disaster Management Act, 2012 and the Climate Change Trust Act, 2010. The main objective of the Disaster Management Act, 2012 is to develop appropriate disaster management system and provide implement the post-disaster responses to reduce the disaster risk to an acceptable level. On the other hand, the objective of the Climate Change Trust Act, 2010 is to make necessary action plan for capacity building and to take measures for adaptation and mitigation of the climate change and disasters. The government of Bangladesh is strongly committed to fulfill the Sustainable Development Goals (SDGs) in the country. The SDGs' goal 1: End of Poverty, Goal 6: Clean

Water and Sanitation, Goal 13: Climate Action, and Goal 15: Life on Land has lot of scope for policy implications from the study findings.

The Government of Bangladesh ratified two international agreements on climate change disasters such as Paris Climate Change Agreement 2015 and Social Framework for Disaster Risk Reduction (SEDRR) (2015 – 2030). Both of these documents are agreed that climate change and disasters have massive impacts on livelihoods and these are committed towards substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons.

Paris Climate Change Agreement 2015

Article 8

1. Parties recognize the importance of averting, minimizing and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and damage. 2. The Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts shall be subject to the authority and guidance of the Conference of the Parties serving as the meeting of the Parties to this Agreement and may be enhanced and strengthened, as determined by the Conference of the Parties serving as the meeting of the Parties to this Agreement. 3. Parties should enhance understanding, action and support, including through the Warsaw International Mechanism, as appropriate, on a cooperative and facilitative basis with respect to loss and damage associated with the adverse effects of climate change. 4. Accordingly, areas of cooperation and facilitation to enhance understanding, action and support may include: (a) Early warning systems; (b) Emergency preparedness; (c) Slow onset events; (d) Events that may involve irreversible and permanent loss and damage; (e) Comprehensive risk assessment and management; (f) Risk insurance facilities, climate risk pooling and other insurance solutions; (g) Non-economic losses; and (h) Resilience of communities, livelihoods and ecosystems.

Sendai Framework for Disaster Risk Reduction (SFDRR) (2015-2030)

The Sendai Framework for Disaster Risk Reduction 2015-2030 (Sendai Framework) is the first major agreement of the post-2015 development agenda, with seven targets and four priorities for action. It was endorsed by the UN General Assembly following the 2015 Third UN World Conference on Disaster Risk Reduction (WCDRR). The Sendai Framework is a 15-year, voluntary, non-binding agreement which recognizes that the State has the primary role to reduce disaster risk but that responsibility should be shared with other stakeholders including local government, the private sector and other stakeholders. It aims for the following outcome: The substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries. The Sendai Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005 – 2015: Building the Resilience of Nations and Communities to Disasters. It is the outcome of stakeholder consultations initiated in March 2012 and inter-governmental negotiations held from July 2014 to March 2015, which were supported by the UNISDR upon the request of the UN General Assembly. UNISDR has been tasked to support the implementation, follow-up and review of the Sendai Framework

If we look the above action plans and related national and international documents of Bangladesh related climate change and disasters including river erosion, we can find a lot of spaces where our study findings can give valuable inputs. Our study includes a number of aspect such as the economic profile of the river erosion affected poor people; their housing, latrine facility, water and sanitation; vulnerabilities, migration and displacement; social dignity, livelihood options, coping strategies and resilience, and food security. All of these aspects are frequently and clearly mentioned into all of the above government agendas and action plans. It is also mentioned that the study findings clearly documented the relationship between disaster (river erosion), poverty and vulnerabilities of the Bhola Distract. Though the study was conducted in Bhola District, but still it represents the major coastal belts and all over the contrary where river erosion is frequent. However, in broader context the findings of the study has wider policy implications. The following policy implications can be considered:

- ***Poverty reduction policy for river erosion affected people***

The findings have direct links with national policy agendas, such as poverty alleviation, development of the ultra-poor and char livelihood project, and special support for the socially excluded people that are frequently mentioned in the all national policies, plans and agendas. The extreme poverty in char areas is one of the major concerns in poverty reduction policy of the Bangladesh government (Islam and Hossain, 2014; Islam, 2018). The government acknowledges in the policy documents that the riverside people are severely disadvantaged in terms of ownership of assets, inadequate access to institutional finances and other basic services, including quality education, healthcare, water and sanitation (Paul and Islam 2015). However, a special poverty alleviation programme would be very fruitful that will consider the local context and local realities.

- ***A holistic management approach***

A nationwide multi-traffic of communication and interaction can be proposed to integrate the activities of different stakeholders into a functional partnership framework (Khan and Rahman, 2007: Islam and Hasan, 2015). The government alone cannot do it due to the constraints of resources as well as the wide scope of the tasks. Therefore, a broad-based partnership involving all the stakeholders is a desirable and realistic approach to all stages of disaster management, namely prevention, preparedness, response, and recovery (Quarantelli 1990; Khan and Rahman 2007; Islam and Hasan, 2015). The possible groups of this partnership include the stakeholders like government ministries/agencies, National Parliament and the Parliamentary Standing Committee on Disaster Management, the NGOs/CBOs, the private sector, the media, academia, donors, and regional countries. This holistic approach to disaster management and mitigation takes into consideration the various larger social, political, and economic conditions and contexts of the river erosion. More important is to take proper management of the embankments that the government builds for the permanent solution of river bank erosion. Recently, the government has taken a mega-project for this embankment. It is now important to coop the local people's support in the management process so that it can be effected with cared by the local people towards sustainable management of the embankments. It will help to stop the sand collection through the individual initiative which is harmful for the embankment. However a strong monitoring system should be established within this holistic management system.

- ***Community-based interventions***

Two major community-based interventions such as the strengthening the active participation of the local river erosion communities and the role of modern technology in enhancing indigenous coping mechanisms would be mostly significant to recover the river erosion affected people (Islam and Hasan, 2015). The evidence of this study shows that the local people are not using this indigenous knowledge much during river erosion. It is also found that the local people do not have much control over the participation on the decision making and recovery construction, planning and programmes. However, an effective participation of the affected people is mostly essential in the decision-making and monitoring processes at the local level through the acquisition of knowledge and skills about the preparedness of hazard intensity can play positive impact on their health, well-being, and safety (Islam et al. 2013; Hutton and Haque 2003). People and communities in the coastal areas in Bangladesh have developed their coping mechanisms over time, which is reflected in the form of indigenous knowledge. Currently, the country has developed a number of modern technologies in disaster management and recovery system. However, this would be important if an effort would take to facilitate the

integration of these two kinds of knowledge for prevention, mitigation, and response of the river erosion areas in Bhola District.

- ***A more resilience and development-oriented disaster policy***

A more resilience and development-oriented socio-psychological disaster policy for the river erosion people would be important. We have found in the analysis of the national plans and policies as well as international agreements that the trend of national and international resource allocation solely towards physical prevention and control of environmental events ignores the need to link the poor and marginalized disaster victims with the development process. In Bangladesh, the marginalized peoples like the river erosion affected people in Bhola Distract have lack of control over their basic economic and political mechanisms, and the conventional development theory has traditionally associated what is popularly termed as a deprivation trap, a reinforcing situation of disenfranchisement, powerlessness, passivity, and apathy (Chambers 1983; Hutton and Haque 2003). It is evident that the current system offers only partial solutions in disaster–mitigation efforts including river erosions. It is therefore recommended that the policy development that concerns disaster prevention and mitigation e.g. river erosion should integrate approaches from science and technology, and societal management.

- ***A community led post-disaster recovery policy***

A community led post-disaster recovery policy is mostly important for the river erosion affected people in Bangladesh, where a large number of the marginalized and poor people live. The coastal communities have assets, e.g. skills, and land that could be leveraged to create new income streams (Islam and Hasan, 2014 Islam, 2018). The fish processing and ship recycling industries could be developed in the coastal areas (Islam and Walkerden 2014). However, the policy strategies should reflect the typical geographical setting such a way so that the local institutions can clearly identify the users and resources (Reddy 2000; Islam and Hasan, 2014). The local peoples' participation through emphasizing local leadership would provide many opportunities to formulate an effective community led recovery policy. There is evidence from the study that the local NGOs' response towards relief and recovery initiatives was very low. But from other studies it is proved that the local institutions including NGOs are more likely to promote and sustain hazard mitigation. This study argues that in every stage, all institutions need leaders to develop goals and strategies, build coalitions, motivate others, resolve differences, and oversee implementation.

- ***Boost up the livelihood opportunities***

There is evidence that most of the time the local affected people expect immediate relief such as cash money, food, and water and treatment facilities after disasters. This is now more important that the vision of disaster policy would be to build the capacity of the local communities to reduce their dependency on relief and increase their own resilience (Islam and Walkerden 2015). The post-disaster initiative such as the relief distribution alone is not enough to enable people to cope with disaster situations resiliently and to fully recover (Mallick et al. 2005; Islam, 2018; Islam and Hasan, 2014). This study reported that due to the lacks of livelihood options, e.g. employment, homestead, cash money, and social networking, the affected people migrated to the nearby places and cities. A number of livelihood options should be included in the post-disaster recovery policy, e.g. immediate cash money (incentive), food-for-work, relief and rehabilitation, and interest free loan service so that the affected people can secure their livelihoods in their local communities.

- ***Restore local histories and cultures***

The government can think to restore the local and indigenous culture, history and resources for the greater betterment of the local communities. However, it is important to consider this in the policy so that it can save these resources. It is seen that many aspects such as indigenous occupations and cultures (local industry and handicraft, hat bazar, school, mosque, temple, jamidar bari, history of liberation war, etc.). It is seen that river erosion always destroy these indigenous resources which is out of the care of the government activities and management.

- ***Inclusive rehabilitation policy for all river victims***

In Bangladesh, generally all development policies address only the river victims who are poor. This study uncovers the suffering and destituteness of all river erosion victims. The study showed that many people are excluded from these services and passing very inhuman life. However, it is now more urgent to provide services to all classes to get safeguard from extreme river erosion. In many cases, the people who were in good economic and social conditions are not entitled to receive the existing services. In some cases, these people do not come due to their social dignity. However, as a riverine country like Bangladesh, it should adopt such an inclusive and separate policy towards to achieve broad and inclusive sustainable strategy to save the river erosion affected people.

- ***Social campaign***

Social campaign is an important policy option in the river erosion affected communities. It is seen that usually, the government and NGOs response very quickly in other types of disasters but that is found very adjournment in the case of river erosion. The study findings evidence that NGOs' response was very low. In many cases, the river erosion affected people are socially behind than the other areas, they are ignorance and illiterate. In many cases, they are not aware about the precaution and impacts of river erosion. As a result, their sufferings go severe. In some cases, these severe sufferings exist over generation to generation, and their voices towards to their protection are very negligible due to their lack of social awareness. The existing policy options do not cover this issue at all. However, a community led social campaign with collaboration of local governance and local NGOs/CBOs are very crucial.

- ***An appropriate food policy for river erosion affected people***

To ensure access to food, a targeted food policy intervention is yet to be developed for these vulnerable communities. As an interim intervention, direct food transfer through food aid programme can boost access to food since these resource-poor households have limited access to food. The coverage of safety net programme in the study areas seems to be inadequate, which need to be expanded significantly. However, in the long-term, development of improved communication, transportation, access to markets and services are also important in supporting existing and alternative livelihoods for individuals and vulnerable households. Poor farmers' access to credit should be ensured. This will enable them to obtain the resources and technologies they might need for adaptation. Adaptation strategies and intervention policies, which are centralized in nature in Bangladesh, need to consider local circumstances when developing new crop varieties, high-value crops and technology particularly for char land in order to accelerate the effective and logical autonomous adoption of adaptation processes. This will enhance the resilience of vulnerable households (Alam et al., 2017).

- ***Supporting programmes***

It should also be taken into account that physical measures may not reduce human suffering and asset damages and losses as much as expected in the long run. These 'hard' investments

must be complemented by education, job training, and other 'soft' investments designed to reduce reliance on resources and assets whose value may be eroded by climate change (Dasgupta et al., 2011). Our study showed that many people moved or displaced to urban slums due to the lack of supporting programmes. Current government policies will determine where this urban population will settle and how well prepared it will be to adapt to a changed climate. Many households have already moved further inland and are adopting positive incentives to promote settlements and urban growth in low-risk areas. Sound policies that promote increased access to education and appropriate job training will better prepare future rural populations for productive urban lives and thus avoid perverse incentives to remain in high-risk flooded areas (Dasgupta et al., 2011).

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Appendix: Data collection instruments

Appendix: 1 Household Survey Structured Questionnaire for Interview

Vulnerability, Social Dignity & Livelihood Choices of the River Bank Erosion Victims in Bhola District of Bangladesh

[The main objective of this research is to explore the vulnerability, social dignity and livelihood choices of the river bank erosion victims in Bhola District of Bangladesh. This research is funded by Islamic Relief Bangladesh. I will be grateful if you share your opinions regarding this topic. Please note that the information given by you will be used only for research purpose, and I will not disclose your opinions and I will strictly maintain the confidentiality of your information. You have every right to withdraw yourself from the interview at any time. After finishing the interview, I will let you know what I have written from you and you will have opportunity to add or delete any of your opinions/information that you will provide. Your cooperation would be highly appreciated]

Q. Code # …… Landmark identity: Main land=1, Char land=2 (HH location nearby) ……..	Name of the Interviewer: …… Date of interview: …… Cell phone number……

1. Demographic Information

1.1	**1.1.1 Name of the Respondent: …… 1.1. 2 Gender:** Male =**1**, Female =**2** (If household head is not found, then write name of respondents: …… **1.1.3 Relationship with the Household head:** ……

1.2 Address: Village		Union	Chandpur	Pakshia	Bhabanipur
			1	2	3
Upazilla	Tazumuddin=1, Burhanuddin=2, Daulat Khan=3		District		**Bhola**

1.3 **HHs Detail Information**

Sl	HHs Members Name (From elder to younger)	Gender (Male=**1** Female =**2**)	Marital status: (Unmarried =**1** Married=**2** Divorced=**3** Widowed=**4** N/A=**5**)	Age	Education (No. of Years of schooling, can sign=**99**, can't sign=**0**)	Main occupation (See below code)	Secondary occupation (See below code)	Average monthly income (in Tk.)
1	2	3	4	5	6	7	8	9
1.	(HH)							
2.								
3.								

4.								
5.								
6.								
7.								
8.								
					Total average monthly income of the Family			

Main & Secondary occupation code: Day laborer=**1**, Agriculture=**2**, Fishing=**3**, Crab cultivation/fattening=**4**, Cow rearing=**5,**
Goat rearing=**6**, Sheep rearing=**7**, Duck rearing=**8**, Chicken farming=**9**, Pigeon rearing=**10**, Rickshaw/van pulling=**11**,
Driver of motor bike/taxi=**12**, Grocery shop=**13**, Tailoring=**14**, Mat/reed production=**15**, Hawker=**16**, Maid servant=**17**, Teacher/house tutor=**18**, Student=**19**, GO job=20, Garments worker=21, House wife=22, Un employed =23, Not applicable 24, Other=**25** (Please specify here……)

	Types of Challenges	Number of family members
1.4 Number of disabled people in the family (if any)	Blind -**1**	
	Lame–**2**	
	Deaf and dumb–**3**	
	Other disabilities -**4**	
1.5 Religious faith of the respondent	Islam = **1**, Hindu= **2**, Christian= **3** Buddhist=**4**, Others=**5** ---------- ----------	

2. ECONOMIC PROFILE OF THE HHs (Occupation-Income-Expenditure-Asset-Land)

2.1 List of assets

Type of asset	**Amount/number**	**Approximate value** (in BD Tk.)
1.Cash capital		
2. Invested resources		
3.Land		
4. Ornaments (Gold/Silver)		
5. Livestock (mention type of livestock separates in the next column)	Cow/ Goat/ Pigeon/ Chicken/ Duck/ Buffalo	
6. House property		
7. Boat		
8. Vehicle		
9. Trees		
10. Fishing net		
11. Shop		
12. Others (specify)		

2.2 Sources of Income

Sources of earnings	Sub-group Specific name of the trade/farming/service etc.	Specific Name of the trade/crop/ farming/ services, etc.	Average monthly income from sales (Taka)	Involvement in the Year 2017 (Month)
1	2	3	4	5

Agricultural Activities Farming	1.Crop cultivation			
	2.Dairy			
	3.Fishery			
	4.Beef fattening			
	5.Goat/sheep rearing			
	6.Mowali/ Honey collection			
	7.Bowali/ Wood collection			
	8.Poultry / chicken rearing			
	9.Other farming			
Non-agricultural Activities	10.Sewing garments	Service or Job		
	11.Service (Job)	Various Job holders/ remittance		
	12.Day laborer	Day laborer in agricultural field Day laborer in other business		
	13.Driving	Rickshaw /van/ Auto/ motor-cycle/ boat driving/ rent/others		
	14.Small Business	Tea Stall, Grocery, Selling trees and Other type of Small Business		
	15. Begging			
Support	16. Govt. pension	Government pension		
	17.Zakat	Zakat & fitra received		
	18. Support received	Old Age Allowance (500 monthly)		
	19. Support received	Widow allowance (500 monthly)		
	20. Support received	Freedom fighters allowance (10,000 monthly)		
	21. Support received	Stipend		
	22. Support received	40 days relief program for river bank erosion victim or stop catching fish		
	23. Support received	Cash for work/ training		
	24. Support received	Disability allowance (500 monthly)		
	25. Support received	Farmers card		
	26. Support received	VGD/VGF		

2.3 Expenditure

Types of expenditure	**Average monthly in taka**
1. Spending for own recurrent capital like raw materials for business /agricultural inputs/ pesticide/ etc.	
2. Food	
3. House (repair, construction, rent)	
4. Education	
5. Health services	
6. Purchasing Clothing	
7. Electricity/gas/water	
8. Entertainment/ Recreation	
9. Transport	
10. Loan repayment (if any)	
11. Festivals	
12. Dowry	
13. Mobile	

2.3 Expenditure	
14. Others	
Total	

2.4 Savings (last one year)	**Total amount in taka**
1. Cash in hand	
2. Cash at Bank	
3. Cash at NGO savings	
4. Others	
5. Total	

2.5 Debt (last one year- 2017)		
1. Bank loan		
2. Loan from friends/relatives		
3. Loan from money lenders		
4. Loan from NGO/micro credit		
5. Debt to shopkeepers / suppliers		
6. Others (Specify)		
7. Total		

2.6 Access to Landholdings (agricultural and dwelling)

2.6.1	Do you possess any land	Yes=**1**	No=**2**
2.6.2	If yes, please provide description of land		

	Types of land	Amount of land (Decimal)	Types of Land used
Sl	1	2	3
	Own		
	Lease in		
	Khash		
	Sharing (Borga)		
	Others		
	Types of land code: Homestead=**1**, Cultivable=**2**, Pond=**3**, Un cultivable land=**4**, Others=**5**		

2.6 Land Susceptibility to the disaster

		Yes=**1**/No=**2**	If yes, what types of land Susceptibility to the disaster (any three code)		
	1	2	3	4	5
	1. Homestead				
	2. Cultivable				
	3. Pond				
	4. Un cultivable land				

Types of vulnerability Code: Monsoon Flood -**1**, Flash Flood- **2**, Draught-**3**, Salinity -**4**, Cyclone Storm -**5**, Tidal surge – **6**, Breaking of Polder (embankment) -**7**, River bank erosion -**8**, Water logging – **9**, Others – **10**

3. HOUSING, WATER SOURCES, LATRINE AND SANITATION PRACTICES

3.1 What is the ownership status of your house?

Owned=**1**	Rented=**2**	Mortgaged=**3**	Living free with neighbor /relative=**4**	Others (Please specify) =**5…….**

3.2 What is the type of your housing structure?

Cemented Building (Pacca)=**1**	Semi-pacca building with Tin roof=**2**	Thatched house=**3**	Tin/Wood/Bamboo=**4**	Mud/straw=**5**	Others (Please specify) =**6**

3.3 Who helped to make your housing?

Inherited=**1**	Own earning=**2**	Donated by government organization=**3**	Donated by NGOs =4	Personal/relative donation=5	Other (please specify) =**6**

3.4 What is the condition of the household housing? (Assess the specific climatic conditions e.g river bank erosion, flood, cyclone etc. for all seasons) (Please probe)

Excellent=**1**	Good=**2**	Moderate=**3**	Fair=**4**	Bad=**5**	Very bad=**6**

3.5 Can your living house withstand strong winds, severe rain, riverbank erosion, flooding or hail without significant damage?

No=**1**	Yes=**2**	Yes, with minor damage=**3**	Perhaps, but with significant damage likely=**4**	Little to no extreme weather in this region=**5**

3.6 Has your home suffered from any damage (natural calamities) in the last 5 years?

No=**1**	Yes, with minor damage=**2**	Yes, with significant damage=**3**

3.7 What type of toilet facility does your household usually use? (probe if possible)

None (open defecation) =**1**	Sanitary Latrine=**4**
Communal, enclosed pit=**2**	Slab with Ring=**5**
Private, enclosed pit=**3**	Hanging latrine=**6**

3.8 What is the main source of water for your household uses? Who owns the source? How far do you travel to fetch water?

Types	Source of water	Ownership	Distance travel (Yard)	Sufficient to meet your requirements (Yes=**1** / No=**2**)	Safety issue for females to fetch water – (Yes=**1**/ No=**2**)
1	2	3	5	6	7
1.Drinking					
2. Cooking					
3.Bathing					
4.Washing					
5.Toilet					

Source of water code: Deep Tube-well=**1**, Shallow Tube-well=**2**, Supply=**3**, Harvested Rain water=**4**, Pond=**5**, Cannel=**6**, River=**7**,

Ownership Code: Fully Own=**1**, Shared =**2**, Relatives=**3**, Community=**4**, Government=**5**, Neighbor=**6**,

4. VULNERABILITY

4.1 Economic vulnerability

4.1.1	In the last 5 years, how many times your HHs have experienced river bank erosion? Which one was the most catastrophic?		Yes=**1**, /No=**2**	How many times ?	Catastrophic Yes=**1**, No=**2**
		2013			
		2014			
		2015			
		2016			
		2017			
		Total			

4.1.2	In the last 5 years, what sort of losses your HH had to face due to these river bank erosions? **(Use multiple code)**	Loss of homestead infrastructure= 1 Loss of land=2 Income loss=3 Loss of homestead land=4 Scarcity of pure drinking water= 5 Crop loss=6 Livestock loss= 7 Morbidity/increasing intensity of disease=8, Loss of employment=9 Injury= 10, Food scarcity= 11 Other (specify)=12…… ……	Estimated monetary loss (total in taka) …… ……

4.1.3	Between 2013 and 2017, is there any agricultural land of your households was affected/degraded due to river bank erosion?	Yes=1, No=2	If yes (total decimal)…… ….	If yes monetary value in taka……..
4.1.4	Between 2013 and 2018, is there any homestead land of your households was affected/degraded due to river bank erosion?	Yes=1, No=2	If yes (total decimal)…… …	If yes monetary value in taka ---------- -------

4.2 Psycho-Social vulnerability

Type of psycho-social vulnerability	**Select and circle the response category that best represent your reaction to each statement**						
	Strongly Agree	**Agree**	**Somewhat agree**	**Somewhat disagree**	**Disagree**	**Strongly disagree**	**No comment**
4.2.1 My family member (s) are suffering from physical or mental disability because of river bank erosion	1	2	3	4	5	6	7

4.2.2 My social and cultural bondage has been broken due to river bank erosion	1	2	3	4	5	6	7
4.2.3 My networking has been broken down due to river bank erosion	1	2	3	4	5	6	7
4.2.4 My household occupation pattern has changed due to river bank erosion	1	2	3	4	5	6	7
4.2.5 River bank erosion has increased the inequality among the society	1	2	3	4	5	6	7
4.2.6 River bank erosion has decreased our social esteem	1	2	3	4	5	6	7
4.2.7 River bank erosion has created psychological problem	1	2	3	4	5	6	7
4.2.8 We feel helpless during river bank erosion	1	2	3	4	5	6	7
4.2.9 We face tremendous challenges with our older people, pregnant women, disabled people, widow and children during river bank erosion	1	2	3	4	5	6	7
4.2.10 Many of our relatives, neighbors and community people moved to another place because of river bank erosion	1	2	3	4	5	6	7
4.2.11 We feel lack of association in the community due to river bank erosion	1	2	3	4	5	6	7
4.2.12 Our mental stress, depression, and anxiety are associated with river bank erosion	1	2	3	4	5	6	7
4.2.13 Gender based violence has increased due to river erosion	1	2	3	4	5	6	7
4.2.14 Child marriage has increased due to river erosion	1	2	3	4	5	6	7
4.2.15 We feel social distance due to river bank erosion	1	2	3	4	5	6	7
4.2.16 We feel insecurity because of river bank erosion	1	2	3	4	5	6	7
4.2.17 Many people in our locality were involved illegal practices due to river bank erosion	1	2	3	4	5	6	7

4.2.19 We did not find any job/work during river bank erosion	1	2	3	4	5	6	7
4.2.20 River bank erosion has increased poverty in our community	1	2	3	4	5	6	7
4.2.21 We do not get any loan facility from NGOs during river bank erosion	1	2	3	4	5	6	7
4.2.22 Many schools and social institutions were damaged by river bank erosion	1	2	3	4	5	6	7
4.2.23 River bank erosion has created food insecurity among the HHs	1	2	3	4	5	6	7
4.2.24 River bank erosion has forced the displacement of the HHs	1	2	3	4	5	6	7
4.2.25 Participation of river erosion victim in recovery process has controlled by the political institutions and local power politics	1	2	3	4	5	6	7

4.3 Migration & displacement			
4.3.1	How long are you living at this locality with your household?	From father's generation=**1**	Temporary=**2** (total year……..)
4.3.2	Did you ever had to displace due to river bank erosion?	Yes =1, No=2	If yes how many times ……..
4.3.3	If the answer is Yes, then during last five years which year you were last displaced?	…… …….	
4.3.4	If the answer is Yes for Q. 4.3.2, what were the causes of this displacement? **(multiple answer possible)**	To avoid inundation=1. To avoid erosion=2. To avoid water logging=3. To avoid salinity=4. To avoid storms=5, To protect households from cyclone=6. Lack of employment=7. Loss of homesteads=8. For better lifestyle=9. Mortgager won't extend time=10, Occupation change= 11	
4.3.5	If the answer is Yes for Q. 4.3.2, then where were you displaced/migrated?	Govt./non-govt. shelter=1, Embankment=2 High elevated land/field=3. Relatives' houses=4. Own land=5. School/college/madrasha= 6. Adjacent village/union/upazila=7. Others= 8…….	
4.3.6	Do you have any plan to be displaced from this locality?	Yes=1, No=2	

4.3.7	If the answer is Yes for Q. 4.3.6, would you tell me the reason(s)? **(multiple answer possible)**			To avoid inundation= 1, To avoid erosion=2 To avoid water logging=3, To avoid disaster, flood, cyclone, storm=4, power structure influence=5, Lack of employment=6, Better life=7, Other=8 ----------		
4.3.8	Did any of your HHs member migrated to other place **temporary** for livelihoods?			Yes=1,	No=2	
4.3.9	If yes, give the following information?					
	Number of Family Members Migrating		Where do they go (code)	For What work/occupation (code)	Year	
	1	2	3	4	5	6
	SL	Sex (Male=**1**, female=**2**)	Any Urban=1 Any Village=2 (If urban, specify the city) Bhola district=1 Barishal=2 CTG=3 Dhaka=4 Abroad =5	Day laborer=**1**, Hawker=**2**, Rickshaw/van pulling=**3**, Bus driver/helper=**4** Garment worker=**5**, Other= **6** (Please specify) ……	Name of month	Number of Months work in migration
4.3.10	Did any of your HHs member migrate to other place **permanently** for livelihoods?				Yes=1, No=2	
4.3.11	If yes, do those members come in the village during marriage ceremony, social gathering, religious festivals or special occasion?				Yes=1, No=2	

5. Livelihood Options

Livelihood options based on natural resources			
5.1	Do you have any dependency on -natural resources for your income and consumption?	Yes=**1**	No=**2**
5.2	If yes, what activities are you engaged in? **(multiple answer possible)**	Catching fish=**1**, crop cultivation=**2**, collecting honey=**3**, snail collection =**4**, leaf collection (golpata)=**5**, shrimp larvae=**6**, Water lily (shaluk)=**7**, crab collecting=**8**, livestock rearing=**9** (including poultry), Others =**99** (specify……)	
Major Livelihood Options			

5.3	What are the major livelihood activities of your HHs? **(List major 3)**	Catching fish own=**1**, Catching fish as laborer=2, Small trade=3, Dry food process-4, Cloth business=5, Sessional stock business=6, Crop cultivation=**7**, Collecting honey=**8**, Snail collection =**9**, leaf collection (golpata)=10, shrimp larvae=11, Water lily (shaluk)=12, Crab collecting=13, Livestock rearing=14 (including poultry), Day laborer=**15**, Crab cultivation/fattening=**16**, livestock=**17**, Rickshaw/van pulling=**18**, Driver of motor bike/taxi=**19**, Grocery shop=**20**, Tailoring=**21**, Mat/reed production=**22**, Hawker=**23,** Others (specify): ……	
5.4	Are you satisfied with the present form of livelihood?	Yes=**1**	No=**2**
5.5	If not, what problems do your HHs face in present form of livelihood? (multiple answer possible)	Damage land due to salinity =**1**, Lack of knowledge about climate adaptive livelihood options=**2**, Water logging=**3**, Flash flood=**4**, Lack of skill in managing livelihood options=**5**, Lack of demand in the market=**6**, Lack of access to extension service providers=**7**, Lack of capital=**8**, rigorous erosion=9 Other=**10** (Specify)…….	
5.6	Do you have any idea about the climate adaptive livelihood options?	Yes=**1**	No=**2**
5.7	If yes, are you practicing at present?	Yes=**1**	No=**2**
5.8	Between 2013 and 2018, is your HHs livelihood has changed?	Fully=1, Moderately=2, Partially=3 Not at all=4	
Livelihood choice & competencies			
5.9	How many members of your family are engaged in income generating activities?	……	
5.10	Have you/any of your family members ever received any training on livelihood development/ starting of livelihood?	Yes = 1 No = 2	
5.11	(If yes) name the type of training you received.	1.---------- ---------- 2.---------- ----------	
5.12	(If yes) name the type of institutes from where you received trainings	Government=1, NGO=2, Individual initiative=3, Islamic Relief=4, Others (name it) =5	
5.13	If (Yes) after received training have you involved/run any income generating activity?	Yes = 1 No = 2	
5.14	What household livelihood skills do your family members have?	**Name of the IGA Please tick**	**(Skills Level) 1 = Very good, 2 = Good, 3 = Fair, 4 = Poor**
		Tailoring	
		Grocery shop	
		Rickshaw/Van pulling	
		Fishing	
		Agriculture	
		Hawker- clothe/ Pickles/ Cosmetics/ Cake	
		Livestock rearing	

		Furniture	
		Tea stall	
		Sanitary	
		Boat man	
		Others (Specify) ……..)	

6. COPING STRATEGIES AND RESILENCE					
Disaster Management					
6.1	Which disaster(s) is/are more frequent in your locality except river erosion?	Salinity=**1**, Cold wave=**2**, Tidal surge=**3**, Cyclone =**5**, Flash flood=**6**, Others (Specify)=**7……..**			
6.2	Do you take any pre-cautions against hazards at the household level?	Yes=**1**	No=**2**		
6.3	If yes, what are they? (multiple answer possible)	Dry food =**1**, Moveable oven =**2**, Savings=**3**, Fire wood=**4**, Supporting / tiding house with bamboo and rope=**5**, Plinth rising homestead=**6**, First aid box=**7**, Tree plantation surrounding the house=**8**, Any other(please specify) ……			
6.4	Is your land protected by embankment?	Yes=**1**	No=**2**	Not applicable=**3**	
6.5	Do you have any training for disaster management?	Yes =**1**	No=**2**		
6.6	Do you have any idea about the different disaster management committees e.g Union Disaster Management Committee (UDMC)?	Yes=**1**	No=**2**		
Coping strategies (During & After river bank erosion)					
6.7	Where do you go at the river bank erosion period in the last 5 years?	Went to Shelter center =**1**, Relatives house=**2**, Stay in own house=**3**, Stay in Bandh=**4**, Stay in school=**5……..**			
6.8	Do you try to reduce cost during river bank erosion?	Yes=1	No= 2		
6.9	If yes, how do you do this? **(Multiple answers)**	Intake less food=**1**, Borrow money=2, Borrow food=3, low cost in clothing and other sources =**4**, increase savings before river erosion=**5**, involve children in work for extra income=**6**, Stop child education and tuition=**7**, other=**8** (Specify) ……			
6.10	Do you send to your income earners to other places for income during river erosion?	Yes=1	No=2		
6.11	Where do you keep your cattle during the erosion period?	Own house =**1**	Embankment=**2**	Killa/Cattle shelter=**3**	No place to keep=**4**
6.12	Do you sell your livestock for cash money during river erosion?	Yes=1	No=2		

6.13	Where do you keep your grain during hazards?	Own house =**1**	Sale out during flood =**2**	No place to keep=**3**	Other=**4**:
6.14	What loss you have conceived during the hazard? **(Multiple answers)**	Life lossed-**1**, Injured-**2**, Cattle lost-**3**, Crop Lost- 4, Land lost- **5**, Capital lost-**6**, Trees lost-**7**, Others-**8**			
6.15	What is the storage system you adopted to store your crop during the hazards?	Household level=**1**, Local Bazar=**2**, Community based food/seed bank=**3**, Govt. storage=**4**, Others=5……			
6.16	During hazards, did you get any assistance from Union Disaster Management Committee?	Yes=**1**	No=**2**		
6.17	If yes, what were their activities for assisting people for "during river erosion" period?	Rescue =**1**, Evacuation=**2**, First aid support=**3**, Others=**4**……			
6.18	Did you get any assistance from any of the government extension service providers during this period?	Yes =**1**	No=**2**		
After river bank erosion (relief, recovery & resilience)					
6.19	After river erosion did you receive any relief?	Yes=**1**	No=**2**		
6.20	If Yes, who provided you the relief?	Govt. =**1**, NGO=**2**, Community=**3**, Individual= 4, Others=5……			
6.21	What were the materials you received from the relief organization? **(Multiple answers)**	Food=**1**, Cloth=**2**, Medicine=**3**, Shelter=**4**, Cash money= 5, Others=6……			
6.22	What was your impression on the relief operation after river erosion?	Highly satisfied=**1**, Satisfied=**2**, Moderately Satisfied=**3**, Dissatisfied=**4**, Highly Dissatisfied=**5**			
6.23	After river erosion, did you get any assistance from government for recovery and reconstruction?	Yes =**1**	No=**2**		
6.24	If yes, which type of assistance your HHs has received? **(Multiple answers)**	Relief=**1**, Food=**2**, Seed=**3**, Family shelter repair=**4**, Cash money= 5, Any other=6			
6.25	Has government taken any permanent measures to stop the river bank erosion?	Yes =**1**	No=**2**		
6.26	If yes, what types of recovery measures government was taken?	Construct embankment=1, Digging the river=2, Set up side wall=4, Tree plantation=5, Others=6----------			
6.27	What was your impression about the government recovery and reconstruction measures after river erosion?	Highly satisfied=**1**, Satisfied=**2**, Moderately Satisfied=**3**, Dissatisfied=**4**, Highly Dissatisfied=**5**			
6.28	Did the NGO's take any recovery measures to reduce the vulnerability of the river bank erosion?	Yes=1	No=2		
6.29	If yes, what types of recovery measures was taken? **(Multiple answer possible)**	Need assessment=1, CBO formation=2, Awareness building=3, Provide seed money=4, others=7……			

6.30	What were the indigenous coping strategies of your HHs against river bank erosion? (multiple answer possible)	Dry food=1, First Aid Box=2, Savings=3, Portable oven=4, Homestead raising=5, Homestead tree plantation=6 Construction embankment= 7, Others=8 ……
Participation in disaster development process		
6.31	Did your HHs participate in the decision-making process of recovery and reconstruction planning and program during river bank erosion?	Fully=1, Moderately=2, Partially=3, Not at all=4
6.32	Did your HHs participate in the implementation process of recovery and reconstruction planning and program?	Fully=1, Moderately=2, Partially=3, Not at all=4
6.33	How do you explain the development decision making process after river erosion in your locality?	Fully access of affected community in the development decision making process=1, Decision making process controlled by the local power politics=2, Limited access of affected community=3, No access=4

7. EDUCATION & HEALTH STATUS OF HHs				
7.1	Do you have any school in your locality	Yes =**1**	No=**2**	
7.2	If yes, what type of school is near to your household	Government primary schools/high school =**1** Government Madrasha =**2** Non-government Madrasha =**3** NGO school/Charity school =**4** Others (please specify) =**5**		
7.3	Do you have your children in the school?	Yes =**1**	No=**2**	
7.4	Do you get any problem in enrolling your children in the school?	Yes =**1**	No=**2**	
7.5	If yes, what are the problems? **(Multiple answer)**	Lack of information about how to get children enrolled= **1** School is too far away= **2** School teachers do not approach parents= **3** Children have no time to go, being engaged in household work= **4** Since the children is physically challenged (PWD)= **5** others= **6……**		
7.6	Between 2013 and 2017, is there any education institution that was damaged by river bank erosion?	Fully=1, Moderately=2, Partially=3, Not at all=4, Do not know= 5		
7.7	Between 2013 and 2017, was the river bank erosion stope the schooling of the HHs children?	Yes =**1**	No=**2**	
7.8	If yes, how many months stopped education?	……		
7.9	What were the common diseases in your HHs members during river erosion last year? **(multiple answer)**	Cold=**1**, Dysentery=**2**, Diarrhoea/Cholera=**3**, Skin disease=**4**, Asthma=**5**, Cough/TB=**6**, Malaria=**7**, Other=**8** (Specify)……		

7.10	Did you go anywhere for treatment?	Yes =**1** No=**2**
7.11	If yes, where did you go to seek treatment?	Village doctor = **1**, Traditional healer = **2** Government "House to house" Health Service Providers=**3**, Community Clinic=**4**, Family Welfare Center (FWC)=**5**, Government Union Health Center=**6**, Government Upazila Health centers=**7,** Pharmacy=8, Religious healer=9

8. FOOD SECURITY			
8.1	Do you have three meals a day regularly?	Yes=**1**	No=**2**
8.2	Table – 2: Food Security Profile (status by month)		

Months	**Meal Frequency**	**Months**	**Meal Frequency**
1. Baishak (April-may)		7. Kartik(Oct-Nov)	
2. Jiashtha (May-June)		8. Augrahayan(Nov-Dec)	
3. Ashar (June-July)		9. Poush(Dec-Jan)	
4. Sravan July-August)		10. Magh(Jan-Feb)	
5. Bhadra(August–Sept.)		11. Falgun(Feb-Mar)	
6. Ashyin (Sept-Oct)		12. Chaitra(Mar-April)	
Meal Frequency Code: **1=**Once, **2**=Twice, **3**=Thrice			

Thank you for your valuable responses