

RIVER BANK EROSION AND ASSOCIATED IMPACTS ON LIVELIHOOD: A CASE STUDY OF HARINATPUR, BARISHAL

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Abstract

The aim of the study was to assess the nature of exposure to the river bank erosion and its associated impacts on livelihood. It is revealed from the study that on an average each surveyed household was more than 4 times affected by river bank erosion. Average loss of family land among the affected households was 362.16 decimal. In most cases, the loss rate of family land was increased after increasing exposed frequency. It was found that loss of family land had negatively impacted on livelihood. About 53% of surveyed households had changed their income source. Among them, more than 85% stated that their financial ability has reduced due to direct or indirect impacts of river bank erosion. This study suggests for establishing permanent polder around the area because the dwellers believe that it is the most effective way to combat river bank erosion, providing monetary and accommodation facility in order to economic solvency and secure livelihood. Moreover, it is urgent need to make honest, sincere and committed political leaders in order to ensure good governance that may contribute in protecting river bank from erosion indirectly in the study area and elsewhere.

Keywords: River bank erosion, Impacts, Livelihood, Good governance

Introduction

Bangladesh is a land of rivers. It occupies about 120,400 sq. km (only 7%) of the Ganges, the Brahmaputra and the Meghna catchment area (Haque, 2008). But, most of the parts of

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floodplain is made of these rivers and their tributaries and distributaries. The country is vulnerable to river bank erosion due its climatic conditions and geographical position. Every year about 10,000 hectares of flood plain wear away by river bank erosion (MWR, 2001; Islam and Rashid, 2011; Rahman and Rahman, 2015). River bank erosion is one of the most unpredictable destructive natural catastrophes in Bangladesh that eternally displaces and impoverish people (Uddin and Basak, 2011; Mollah and Ferdaush, 2015). River bank erosion directly affects about one million people in Bangladesh (Islam and Rashid, 2011). These people are forced to stay in disaster prone areas that make them more vulnerable in order to further displacement (Barton and Brocklesby, 2004). The rate of landless and displacement may increase with the increase of river bank erosion (Kamal, 2011).

Addressing the effects of river bank erosion flood controlling measures specially physical and engineering objects were the key issues to be assessed till the late 1980s (Elahi et al., 1991; Haque, 1997) while effects on demographic and socio-economic issues were studied later (Hutton and Haque, 2004). However, researches have rarely found the effects of bank erosion on livelihood that make landless and insecure lives. The objectives of the research were (i) to find out the nature of exposure to the river bank erosion in the study area; (ii) to assess the impacts of river bank erosion on livelihood in the study area; and (iii) to find out possible way forward to mitigate river bank erosion in the study area.

Materials and Methods

Harinatpur union was selected as the study area purposively. The union is most affected among the unions of Hizla Upazila under Barishal district in the context of river bank erosion. Total area of the union is about 6005 ha, of which about 100 ha are affected by various degrees of land degradation mainly caused by river bank erosion (MoL, 2011). Two most vulnerable Muazas (Tumchar and Mahishkhola) of the union were selected for the study (Fig. 1).

The research encompasses primary and secondary data and information. Primary data sources were basically field observations and questionnaire survey. Total 80 households were purposively selected for conducting questionnaire survey in the study area. Questionnaire survey was carried out in the left side and started maximum 100 meter away from the Meghna river bank. All respondents age were above 40 years and respondent size by gender was equally (40 males and 40 females) and sequentially (first male than female) distributed. The distance in between two households was at least 20 meter. Besides, journal articles, reports, books were used as secondary data sources.

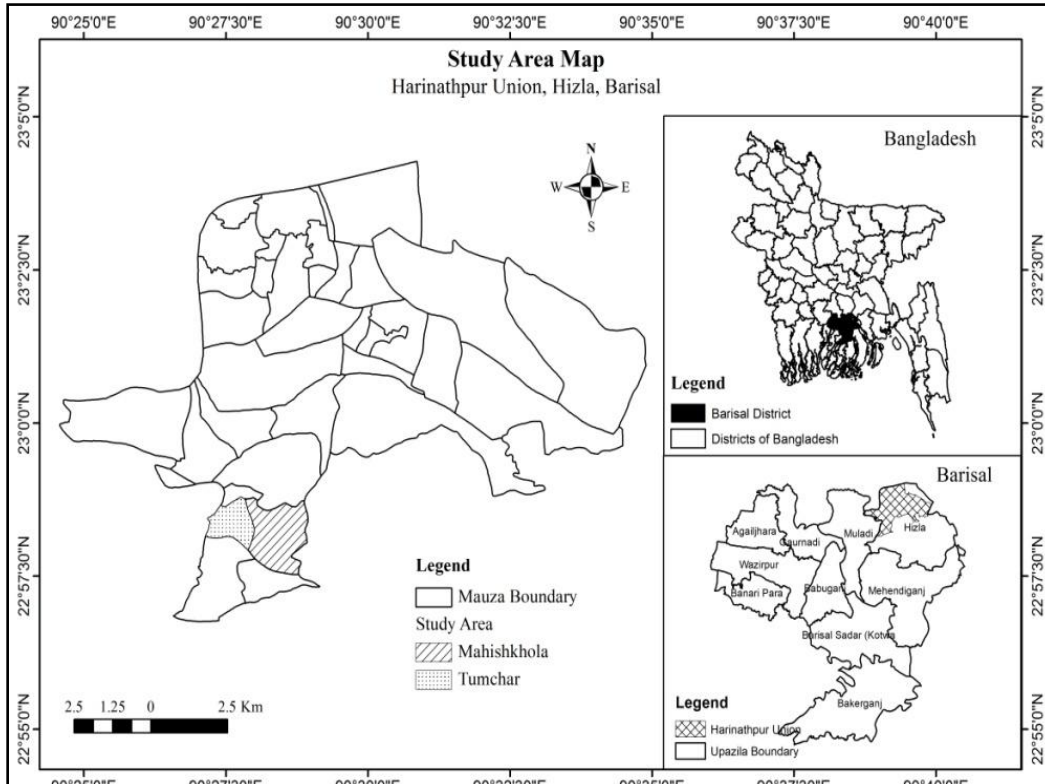


Fig. 1. Study area map of the study area.

Results and Discussion

Socio-economic profile

Total 80 households were surveyed in the study area. The study found 350 family members in the surveyed households including 54% male and 46% female. About one third of the family members do not have any formal education. Only 10.2% family members have more than 10 years of education. Average household size was more than four. Among the total family members, about 31% were found as economically active. Dependent population were under aged members (age below 20 years) and aged members (age 60 years and above) of the families. Agriculture was identified as the main income source of the earning family members while day labor and fishing were in lowest tier. Fig. 2 shows detail about occupation and occupation wise mean income of the income men.

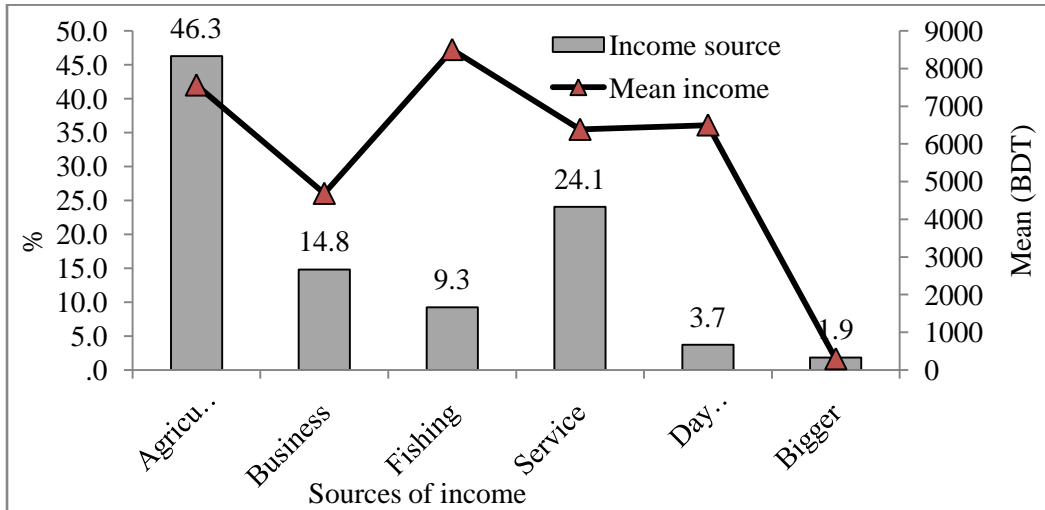


Fig. 2. Occupation and occupation wise mean income of the income men.

Moreover, it was found from the questionnaire survey result that, average monthly income of the surveyed households (after adding income of all earning men of the respective family) was BDT 9133.00 (min. BDT 300.00 and max. BDT 25000.00).

Settlement History

The settlement history of the surveyed households represent that the average tenure was about 28.16 years. Fig. 3 shows that only 7.5% household’s settlement history ranges between 0.5 to 10 years while more than one third ranges between 21 and 30 years and only 12.5% household’s settlement history was more than 50 years.

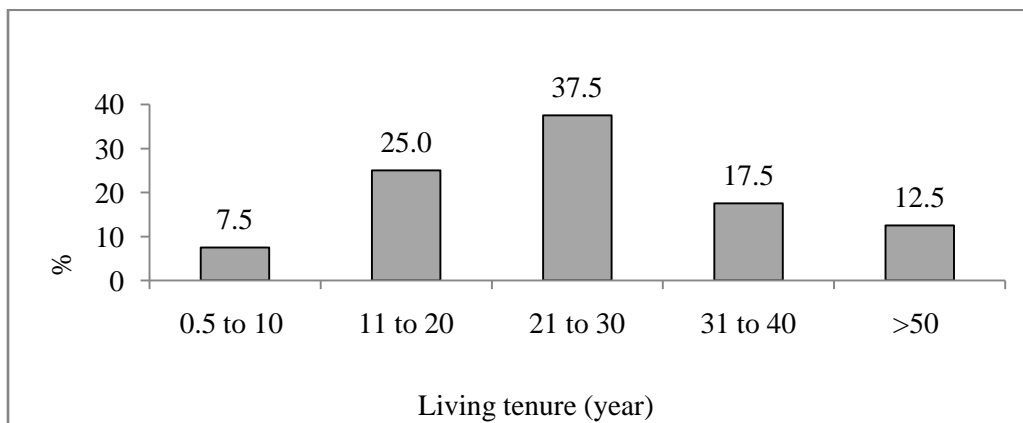


Fig. 3. Settlement history of the surveyed households.

Prediction of River Bank Erosion

A question was asked to the respondents knowing how erosion took place in the study area. Maximum three responses were considered (Table 1). Most of them (77.5%) replied they can assume when river bank erosion takes place. Amongst them, all said that typically large or small scale river bank erosions happen during the rainy season. In addition to that, about 61.1% stated that they can assume by analyzing increasing nature of stream velocity and volume of water based on their previous experience. About 91.9% can predict river bank erosion by observing new land formation on the opposite bank. Moreover, about 41.9% said they can assume by analyzing current wind velocity and direction with earlier incident. Therefore, it is understood that most of the surveyed households have the capability to predict the bank erosion.

Table 1. Prediction of River Bank Erosion

Variable	Responses
(a) Can you predict river bank erosion?	N=80
-Yes	62 (77.5)
-No	18 (22.5)
(b) How can you predict? (Maximum three responses)	N=62
-usually erosion happen during rainy season	62 (100.0)
-by analyzing increasing nature of stream velocity and volume of water	41 (61.1)
-by analyzing nature of opposite bank erosion	57 (91.9)
-by analyzing wind velocity and direction	26 (41.9)

Nature of Exposure

River bank erosion is a severe problem for the people of Bangladesh. It is also severe problem for the people of the surveyed area. Each year about 10 thousands of people are made homeless throughout the country due to river bank erosion (Keya and Harun, 2007). Loss of family land is the most severe impact of bank erosion that makes the population more vulnerable to smooth living. Among the surveyed households, 22 households observed 3 times river bank erosion in the study area of which 20 households were affected three times and other two households were not affected. On the other hand, highest frequency of observed river bank erosion was 17 times and also 17 times affected. It is visualized that only two households didn't observed any river bank erosion. Among the affected households (n=76), about 76.3% were affected in 2012 river bank erosion. This study also found on an average each surveyed households were more than 4 times affected by river bank erosion. Table 2 shows detail information of observed frequency of river bank erosion and affected frequency of the surveyed household.

Table 2. River bank erosion observed frequency and affected nature of observers

Occurrence observed	Number of Times Affected											Total
	0	1	2	3	4	5	6	7	8	12	17	
	Time	Time	Times	Times	Times	Times	Times	Times	Times	Times	Times	
0 Time	2	0	0	0	0	0	0	0	0	0	0	2
1 Time	0	10	0	0	0	0	0	0	0	0	0	10
2 Times	0	2	10	0	0	0	0	0	0	0	0	12
3 Times	2	0	0	20	0	0	0	0	0	0	0	22
4 Times	0	0	0	2	8	0	0	0	0	0	0	10
5 Times	0	0	0	0	0	2	0	0	0	0	0	2
6 Times	0	0	0	0	0	4	2	0	0	0	0	6
7 Times	0	0	0	0	0	0	0	4	0	0	0	4
8 Times	0	0	0	0	0	2	2	0	4	0	0	8
12 Times	0	0	0	0	0	0	0	0	0	2	0	2
17 Times	0	0	0	0	0	0	0	0	0	0	2	2
Total	4	12	10	22	8	8	4	4	4	2	2	80

Impacts on Livelihood

About 18% landmass gets submerged by flooding in Bangladesh, while it may be nearly half in severe years (Chowdhury, 2000). A total of 76 households were affected by river bank erosion in the study area. Fig. 4 shows amongst the affected households, about 37% had lost 1-100 decimals of their family land due to this catastrophe and about 13% had lost more than 500 decimals of their family land. It is also visualized that average loss of family land was 362.16 decimal while maximum 3200 decimals and minimum 6 decimals.

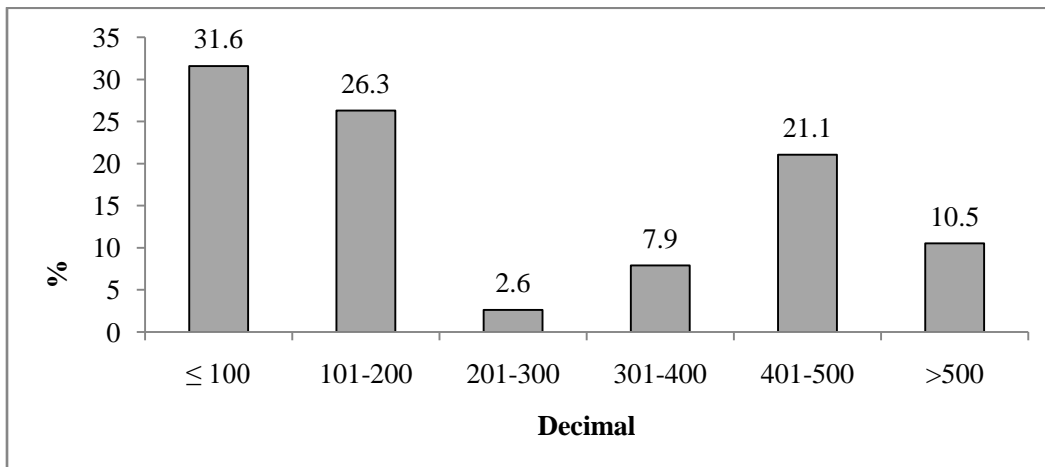


Fig. 4. Loss of family land due to river bank erosion in the study area.

Moreover, following figure (Fig. 5) depicts mean loss of family land among the affected households similarly. It is found that mean loss of family land among the 3 times affected households was 112 decimals. In most cases, the rate of family land loss was increased with the increase of affected frequency.

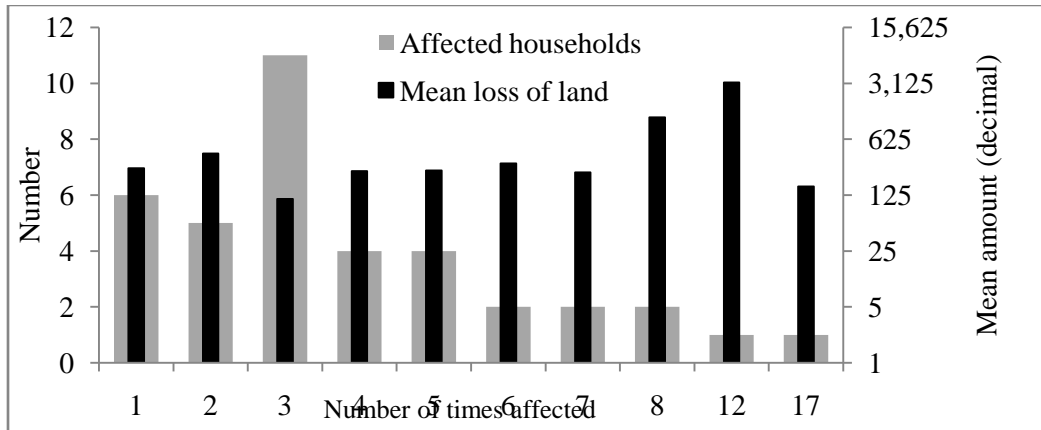


Fig. 5. Frequency and exposure wise mean loss of family land.

Loss of family land negatively impacted on the livelihood of the surveyed households. Among the surveyed households, 52.5% had changed their income sources due to river bank erosion. Amongst them, 28.6% households had changed their family income sources from large scale agriculture to small scale agriculture because they had lost their agricultural land due to river bank erosion. On the other hand, 14.3% households had sequentially changed their occupation from agriculture to service, business to service (migrated to Dhaka) and business to agriculture (Fig. 6).

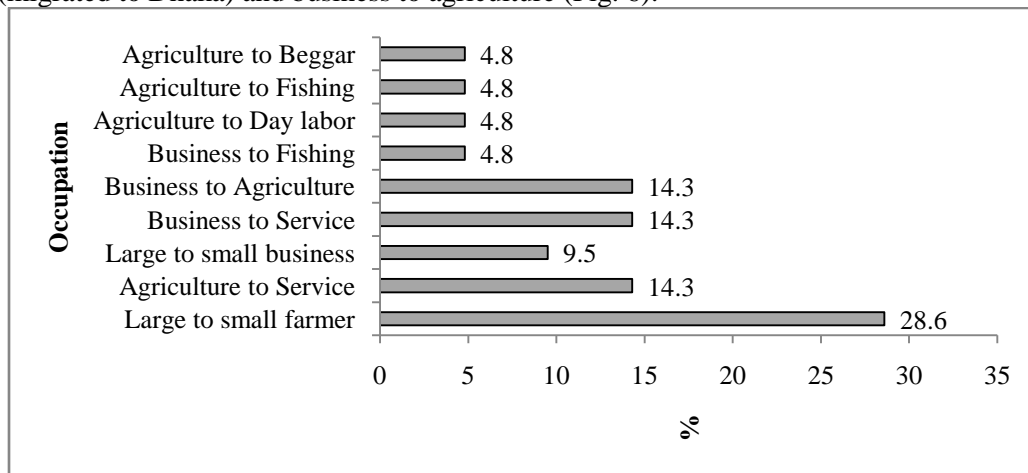


Fig. 6. Changing nature of sources of income.

Amongst the families with new income source, 85.7% stated that their financial ability has reduced due to direct or indirect impacts of river bank erosion. Therefore, their family status has changed. It is visualized that maximum reduction of income happened among the maximum number of displaced households.

Respondents' Perceptions on the Mitigating Measures

Fig. 7 shows almost 90% of the surveyed households have given emphasis on establishing permanent polder around the study area because they understand that it is the most effective way to combat river bank erosion. On the other hand, about 77.5% have given emphasis on monetary assistance and about 60% on shelter assistance. They are thinking that already they have lost enough and had nothing left. Therefore, they want economic solvency and accommodation facility from the government. In addition, honest political leader was identified as the negotiating and implementing agency by the 15% of surveyed households of the study area in order to mitigate river bank erosion. Moreover, about 20% respondents focused on other social safety net programs such as cash for work, food for work, and other allowance.

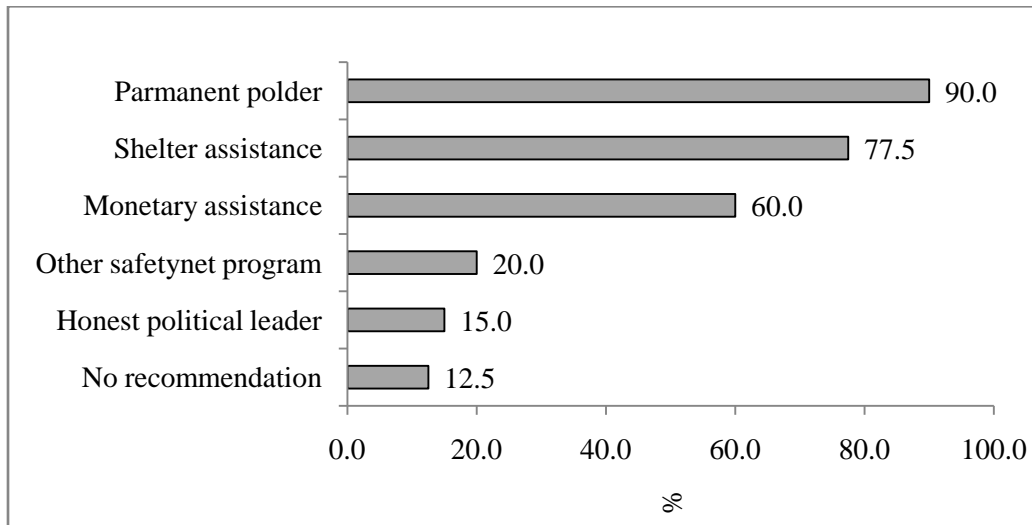


Fig. 7. Recommendation of the surveyed households.

Conclusion and Recommendation

River bank erosion contributes immensely to the process of marginalization of a large number people, displacing households and adversely affecting their and social and material circumstances. This study almost found same scenario in the study area. Average displacement rate was 4 times in the study area that causes average loss of 362.16

decimal family lands. Loss of family land had negatively impacted on the livelihood of the surveyed households. More than 50% of surveyed households had changed their income sources due to river bank erosion. They mainly changed their occupation from large scale agriculture to small scale agriculture, agriculture to bagger/fishing/day labor/service, business to service etc. Hence, their financial ability had reduced. establishing permanent polder around the area because the dwellers believe that it is the most effective way to combat with river bank erosion, providing monetary and accommodation facility in order to economic solvency and secure livelihood. In addition to that other social safety net program such as cash for work, food for work and other allowance should be launched immediately. Moreover, it is urgent need to make honest, sincere and committed political leaders in order to ensure good governance that may contribute in protecting river bank from erosion indirectly in the study area and elsewhere.

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