

## **Adaptive Strategy in Riverbank Erosion: A Study in Naria Upazila, Bangladesh**

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**Abstract:** This paper is mainly focused on the vulnerabilities and adaptation process of the riverbank erosion affected people. As part of adaptation process most of the affected people have to migrate to anywhere from their native land but find out the channels they follow to be migrated is also the purpose of this study. The study employed mixed method to collect data from the respondents of the highest erosion prone area. To collect data this study used interview through semi structure questionnaires, focus group discussion (FGD) and case study methods. Findings show that affected people have to face different types of vulnerabilities. To come back from sufferings they take different types of strategies. As riverbank erosion washed away everything so their relatives and kinsmen help them in different ways. Most of the people migrate by following the channel of their relatives and acquainted as they can get support from them.

**Keywords:** Riverbank, erosion, adaptation, affected people, vulnerabilities.

### **1. Introduction**

River Bank Erosion is one of the common natural disasters in Bangladesh (Iva et al., 2017: 373). Because Bangladesh is situated on the delta of the Ganges-Brahmaputra-Jamuna river systems, with more than three hundred perennial tributaries and distributaries, it is also among the world's most vulnerable countries to the effects of flooding and riverbank erosion. The major rivers of the country, namely the Ganges-Padma, Jamuna-Brahmaputra, and the Meghna, drain a 1,559,400 square kilometers catchment area, with only 7.5 percent of this area in Bangladesh itself (Hutton & Haque, 2003: 406). Bangladesh is suffering from acute riverbank erosion (Baki, 2014: 3). Every year, approximately one million people are affected by river bank erosion. River bank erosion not only compels people to migrate or leave their place of origin, but also destroys their belongings (Sarker & Rahman, 2018: 81). As the consequences, every year a sizeable population is affected by erosion. People not only lose their houses and agricultural lands but also become displaced often permanently and impoverished (Rana & Nessa, 2017: 60). Riverbank erosion causes huge amount of socio economic losses; from homestead loss to death. People suffer from lack of food and getting access in shelter. Most of the cases of riverbank erosion the people living on the bank have to migrate from eroded area to another for one time or more. The Padma is the biggest river in Bangladesh. In different areas, the bank of the River Padma eroded and also is eroding continuously. Different parts of the bank of the river have been eroding for a long time. But in mid-September 2018 the bank of The Padma River has eroded drastically and washed away numerous houses and vast amount of land.

On 10<sup>th</sup> September 2018 bdnews24.com had published news entitled "More than 4,000 people of Naria Upazila in Shariatpur have become homeless due to the erosion on the Padma River in the last seven days". In the detail part of the news bdnews24.com has said that-The upazila's Muktarer Char, Kedarpur Union and 4 No. ward of Naria

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municipal area went under water due to erosion in the past last two months, according to the local government. A large portion of 200-year-old Mulfathganj Bazaar went under water last week. Mulfatganj Bazar, Char Jujura village, Kedrpur Daspara and Uttar Kedarpur were among the areas hardest hit by erosion. In addition to homes, all of the roads, bridges, culverts and the other infrastructures in the area have been submerged. River erosion devoured thousands of acres of farm land.

By reading the news about the sufferings of the affected people I decided to know how the affected people of Naria adapt themselves to this broken situation. Though the news addressed different eroded areas, but most vulnerable and severe erosion prone area was a part of Naria Municipality and Daspara Kedarpur village of Kedarpur Union. So, for this study, these two areas have been selected as research area for this study. As the news described that the affected people have lost houses, homestead land, arable land, damaged local roads, bridges and other infrastructures. In one word the people living on the bank of the Padma River beside Naria and Kedarpur have lost everything and become poor overnight. But one thing drew my attention that as they lost everything, so how they manage themselves i. e. how they adapt with their present situation? And migration is also part and parcel of the natural disaster induced people. So, in which channel they follow to be migrated was also the important part of the study.

## 2. Objectives

River erosion seriously affects the livelihood of the affected people. Being affected many people become asset less, homeless, landless, in a word poor overnight. They lose homestead, house, cultivable lands, kitchen garden/home yard land and many other properties (Baki, 2014: 30). While the majority of rural people do not have access to food, housing and medical facilities, the disaster of riverbank erosion further intensifies the rate of landlessness, homelessness, unemployment and under-employment every year. In such alarming and aggravated conditions as these, the displacee resiled themselves to formulate and undertake multiple measures and techniques for meeting their enormous socio-economic needs triggered by the riverbank erosion displacement and the consequential immense sufferings in the absence of organizational responses (Islam, 2007: 10). To get rid of their disastrous situation affected people had to take different steps. In their locality they had not anything by which they could manage their livelihood. So, they had to follow diversified techniques and methods to adapt with the changing situation. The objective of this study is to know the techniques of adaptation of the respondents after being affected. And if they wanted to be migrated for survival where they want to migrate; any place where they have relative or close kinsmen or anywhere they can.

Specific objectives of the study are-

- a. To find out the techniques of adaptation of riverbank erosion affected people.
- b. By reading the existing literature, it is found that migration is immediate strategy to the riverbank erosion affected people. But in which channel or way they follow to become migrated is a question. So, to identify the channels through which the affected people want to be migrated is also an objective of this study.

### 3. Methodology

The data for this study have been collected in several times from September to November of 2018. Different anthropological methods have been used to collect data for this study. Respondents have been selected through purposive sampling. To collect data interview through semi-structure questionnaires, Focus Group Discussion (FGD) and case study methods have been used. And to meet the needs of the study also has been taken part in different informal discussion with the affected people. Data have been collected from both primary and secondary sources. As a secondary source of data different books, related to the theme of the study, journals, reports of daily newspapers, and articles related to riverbank erosion have been reviewed. On the other hand, primary data have been collected from the respondents of the study area. Forty eight households have been selected on the basis on the severity of erosion to collect data by using purposive sampling. The household head was the respondent. Whenever the household head was absent, then his wife, and in the absence of household head's wife the elder son was considered as a respondent. Among them, I have collected data from thirty five respondents through interview and remaining thirteen respondents have been selected for focus group discussion. In different two groups of six and seven respondents were formed for sharing their experience of sufferings and adaptation due to riverbank erosion.

### 4. Research Area

I have collected data from the inhabitants of 4 no. ward of Naria Municipality and Kedarpur Daspara village of Kedarpur union under Naria upazila. Geographically both areas are located on the bank of river Padam. The statistical number of total population is not found because a number of affected people have made temporary house in these areas to survive immediately after riverbank erosion and some people may migrated somewhere. It has been changing the real statistics of the population of these tow areas. I have chosen these areas according to severity of erosion and sufferings of the people.

### 5. Reviewed Literature

Asian countries tend to be more vulnerable to riverbank erosion due to their high population density and poor economic conditions. Large sections of the population in these countries live along the rivers and are more likely to be affected by bank erosion (Das et al., 2017: 79). Bangladesh is one of the riverbank erosion prone and coastal over populated countries. Baki (2014) tried to outline some socio-economic impact on the affected people of Gorai riverbank erosion. He emphasized on the scenario of Kumarkhalli of Kustia District. In his paper, he wanted to draw attention of policy makers and governor to ensure good governance and make policy to lessen the vulnerabilities of the people living on the bank of Gorai River.

Karim (2014) has done a thought provoking piece of work entitled 'Flood and Riverbank Erosion Displaces: Their Indigenous Survival Strategies in Two Coastal Villages in Bangladesh'. In the paper he outlined some strategies how the riverbank and flood affected people cope-up with the changing situation. He also gave importance to some indigenous mechanism through which displaced people of two marginal villages of Bangladesh migrate from their native land to another. Das et al. (2014) has identified the sufferings of the erosion induced displacement of the people of India. They said that displaced people suffer from different types of insecurities.

Zaman & Wiest (1991) addressed the resettlement issue of the people uprooted by riverbank erosion and the dispute created regarding domination on newly emerged char island and reallocation of the land. The scenario of the present study area is completely different from the study of Zaman and Wiest. Here is not any dispute regarding char land. But there is coherence among the affected people. And most of the cases the rich people give a piece of land without any cost to affected people to build or rebuild house. Amin (1991) described the settlement strategies of the riverbank erosion affected people of Bangladesh. He has also drawn attention of the policy makers to make policy as the displaced people due to riverbank erosion can be resource. Sarker and Rahman (2018) identified the volume of riverbank erosion migration and the way how to minimize erosion.

The degree of economic loss and vulnerability of population due to bank erosion was significant. For instance, the impact of land loss involved primarily the loss of homestead land, housing structures, crops, cattle, trees and household utensils. Admittedly, homesteads-loss instigated by the river erosion forced people to move to new places without any option and put them in vulnerable situations (Shetu et al., 2016: 194)

Alam (2017) indicated the vulnerabilities due to riverbank erosion in two highly erosion prone district Shirajgonj and Tangail. He stated that riverbank causes different vulnerabilities such as impact on livelihood strategies and access to food, water and health facilities. He described the poverty cycle, limited access to food that turn insufficient calorie and finally the affected people become the vulnerable to be sick. As they were economically poor, so they can not take proper treatment that disabled them to join the work from which they can earn wage.

Islam (2017) described vulnerabilities of riverbank erosion and intervention led by community people in three unions of a coastal District of Bangladesh. He has emphasized on different types of vulnerabilities and community resilience regarding riverbank erosion. Haque (1988) described the coping strategies of the riverbank affected people of Kazipur upazila of Sirajgonj. He identified individual and communal response to the hazard occurred by Jamuna riverbank erosion and also looked into the adjustment mechanism of the people. But it was 1990s, now situation has been changed. Specially, at present, along with government, different NGOs also play important role to recover vulnerabilities and sufferings.

According to the Department of Disaster Management (DDM), riverbank erosion, which is caused by the continuous shifting of channels, the three major rivers the Jamuna, the Padma and the Meghna alone displaces an estimated 500,000 people annually. Salt water intrusion from sea level rise in low-lying agricultural plains, along with other hazards, could lead to 40% decrease in food grain production and will force migration to urban slum areas (CDMP II, 2014:11).

From the mid of 2018 the bank of the Padma river beside Naria town of Shariatpur started to erode. In 18<sup>th</sup> September 2018 'The Daily Janakantha' published news on 'Naria Upazila under terrible erosion of the Padma River' (The Daily Janakantha, 18 September 2018). As most of the people lost everything; from homestead and arable land to business enterprise, so they have nothing remaining in their hand. To take a survival strategy they had to migrate to anywhere for livelihood. So if they migrate to any new areas, how they

introduce themselves, manage employment or Income Generating Activities (IGA) and in one word, to adapt them with the new locality is a tough job. There are some studies on the riverbank erosion, migration and the impact of erosion on livelihood. Among these, some papers had emphasized on the adaptation of the victims in different areas of the country. But there is a little research was found on strategies of adaptation of the affected people of Naria, Shariatpur. On this ground, this study tried to find out the techniques and strategies of adaptation of those people. And as part of adaptation people migrate to different areas of the country, but the question is which factors encourage them to be migrated in any particular area.

According to Anthony Oliver Smith (1996) “Three general perspectives on hazards and disasters have developed in anthropology: (a) a behavioral response approach, (b) a social change approach, and (c) a political economic/environmental approach”. In this study behavioral response approach and social change approach are so much related. After being affected by riverbank erosion people respond differently in different situation. The only individual response is not enough for recovering of this disaster. It is also a matter of concern that how people, community and other organizations respond to that disaster and through this response how they adapt themselves with the environment.

## 6. Result and discussion

### A. Riverbank erosion and vulnerabilities

Riverbank erosion is an endemic natural phenomenon that occurs in Bangladesh. The vast flood plains of the three major river system-The Padma, The Brahmaputra-Jamuna and Meghna-have made Bangladesh one of the most vulnerable countries in the world to flood and riverbank erosion (Zaber et al., 2018:1). The damage occurs in many ways and the impacts can be as complex as the economy itself. Riverbank erosion has an adverse impact on the livelihood as homesteads are destroyed, cultivable lands are wiped out and employment opportunities are reduced. In most of the cases, homesteads in riverbank areas are located after the agricultural fields. Wiped out of homesteads implies that the family or individual lost the total assets (Uddin & Basak, 2006: 21). According to A. H. M. Zehadul Karim (2014) During the severe flood and riverbank erosion, the villagers faced many problems. In June 2018 Mustak Ahmed, a reporter of The Daily Jugantor, had predicted that “Roads, shops, houses, educational and religious institutions, markets and even hospitals may be destroyed by river erosion” (Ahmad, 19 June 2018). Prediction had turned into reality in mid-september of 2018. During my fieldwork, I also had witnessed the damages, vulnerabilities, and sufferings of the affected people. The Major impacts and vulnerabilities of riverbank erosion are;

- i. **Loss of infrastructure:** Riverbank erosion damages many infrastructures severely. According to the respondents, many houses, roads, culvers, educational institutions and business enterprises have gone underwater. BBC Bangla in their news entitled ‘River erosion in Bangladesh: This three-story house disappeared right before our eyes’ had described that “hundreds of houses and large structures have been submerged in the river Naria Upazila in Bangladesh due to severe erosion of the river Padma” (Kallol, 6 September 2018). In this news, it is said that a three storyed building had gone underwater in a moment. Not only house but also all types of infrastructures had gone underwater. Govt. Upazila health

complex, non-government clinic and other infrastructures had completely ruined off.

- ii. **Eroding cultivable land:** Riverbank erosion in Naria has eroded a big amount of cultivable land and crops cultivated in Kedarpur Daspara village. One of the respondents had said that he got roughly two acres of land as inheritance but now he is completely homeless and has not any piece of land for cultivating.
- iii. **Extinction of educational and social institution:** It is found that two govt. school has gone underwater due to overwhelming riverbank erosion. Simultaneously many social and religious institutions like club and mosque also have vanished due to riverbank erosion. A sixty years informants said that “you did not see the erosion of the destructive Padma river, not only these two schools but the government have been establishing school continuously and the Padma river destructing these parallelly”. He asked what will be by establishing school in such way. From the above statement, we can realize how the riverbank rupture made a spot in his mind.
- iv. **Disappearing road, embankment and bridge:** Riverbank erosion at first affects the embankments, roads, bridges and culverts. When embankment has eroded then tidal surges enter into the locality and by the hits of the current of the water muddy of the roads be fluid and all the infrastructures become weak and break down. In research area, a sizeable amount of roads had gone underwater and by the speed of the water, a bridge, linking with Mulfotgonj bazaar to the nearby village had completely vanished.
- v. **Annihilation of business enterprise:** The area of Mulfotgonj bazaar had become lessen due to continuous riverbank erosion. Nearly twenty shops in this bazaar had gone under the water in recent time-a respondent said. Furthermore, Sadhur bazaar launch ghat along with many shops and tea stalls have got missing within a few seconds.
- vi. **Vanishing home and homestead land:** All the respondents have experience of losing their home and homestead land because the area in which they are living now is not their ancestor's locality. When I had conducted FGD all the respondents shared that they are now living in a temporarily made house because they had lost their homestead land house due to the severe riverbank erosion that occurred in May to October of 2018. But this is not the first time but they have been facing such types of sufferings for a long time.

Padma River eroded homestead land, agricultural land, pond and lost many others property likes homestead plants, tube well, crops of the victims in the study area (Ghosh & Mahbub, 2017: 66). Being affected by riverbank erosion the people of the study area follow some adaption strategies to cope up with the broken situation. In the next part, we will see what types of strategies the affected people follow.

## **B. Adaptation strategies**

### **B.1 Migration**

Migration is an inseparable part of the life of the people affected by riverbank erosion. All the informants of the research area have a long term traditional experience to be

migrated affected by riverbank erosion. Migration is the alternative way of livelihood management (Ghosh & Mahbub, 2017: 62). Being migrated to any area where there is no riverbank erosion gives sustainability in their livelihood options. The aged respondents stated that they have to be migrated several times in their lifetime. “Asian countries tend to be more vulnerable to riverbank erosion due to their high population density and poor economic conditions. Large sections of the population in these countries live along the rivers and are more likely to be affected by bank erosion” (Das et al, 2017: 79) and Bangladesh is also a country lies in South Asia. The people and resources of the country are under the threat of riverbank erosion due to its geographic and geologic settings and every year hundreds of people migrated from the study area with no source of food and shelter (Rana & Nessa, 2017: 68). Riverbank erosion constantly affects the life of the inhabitants living on the bank of river Padma, especially the erosion-prone part of Naria Upazila. But the decision to be migrated depends on the severity and vulnerabilities carried out by the riverbank erosion and also takes some time to decide by which channel and in which area they will be migrated.

As I have collected data immediately after riverbank erosion. Till then the people didn't migrated but planning to migrate to anywhere. In the question of migration they all are answered that they have not any livelihood option here without migrating. So they have expressed their planning of migration to different destinations.

Table 1: Planned destination of migration

Intended Destination of migration	Number of Respondent	Percentage
Migration to Dhaka	10	20.83
Migration to Shariatpur	6	12.50
Migration to other Upazila of Shariatpur	8	16.67
Migration to other union of NariaThana	5	10.42
Migration to nearby shelter project	9	18.75
Migration to different part of Bangladesh	10	20.83
Total	48	100

Source: Field work by author

According to the above table, we can see that all people want to or have to migrate to any area where they can survive. But the important thing is that most of the people want to migrate any cities or town area. There is more opportunity to manage work than rural area. But in disaster-migration pattern of the study area people willing to migrate both in cities and rural area also. People want to follow rural-cities migration, who are extreme loser due to riverbank erosion and also had lost everything. They have not any livelihood option or find any way of income. They are now in severe crisis. Informants said that as in cities area, there is more earning option so if they migrate to town, it is easy to find any work through which they can survive. On the other hand, those people who have not any skill and do not know any work without fishing and cultivating related activities they want to rural-rural migration if he migrated to another part of his union he can manage

the same work as before of the riverbank erosion. For example, a fisherman is completely dependent on the river and most of the fishermen do not know any other work by which he can earn wages. The table indicates that 18.75% of the respondents want to migrate to the nearby shelter project. Among this category, most of the respondents are fishermen and they are completely dependent on the river to manage livelihood. A portion of affected people (10.42%) wants to migrate to the same union of their Upazila and most of the people belong here in agriculture related activities. So for them it is easy to get work in rural areas rather than cities. But those people who have technical knowledge for example, tailoring, rickshaw pulling or driving motor vehicle they want to migrate any cities. And people who earn wages through seasonal work they have not any problem to migrate anywhere in Bangladesh.

People affected by riverbank erosion migrate to different areas and in different scale. According to the statement of the respondents where they will be migrated is depend on the severity of erosion, having alternative livelihood options or not, the opportunity to get any work, having or not any relative who can help him there, having any land or not etc. These people have been facing and gathering experience of riverbank erosion. So they know where they have to be migrated. According to them, affected people usually want to a) Short distance migration, b) Long distance migration, c) Short term migration and d) Long term migration.

## **B.2 Migration Channel**

For migration the people are choosing those areas where they have easy access, get land to cultivate, have necessary support from their relatives, scope of job opportunities, better life guarantees, have educational opportunity and access of basic needs (Bhuiyan et al., 2017: 11). Where they migrate is not fact, but important is every affected family has to migrate anywhere in the country. River erosion bound them to migrate. The remarkable thing is that people affected by riverbank erosion migrate through a channel where they have relatives, kinsman, any acquainted people or at least to a person who is known earlier. To be migrated every affected person somehow follow one or more channel of their relative, neighbor or a man known earlier to migrate anywhere. According to the respondents, most of the people migrate somewhere one or more person is known earlier to him or his family members. And at the time of crisis those kin groups, relative or acquainted extend their hand to help the affected people. For example, when a family lost everything they yield help from anywhere they get. At this time members of the family are trying to find out options to go there to get shelter and generate income. The relatives living Dhaka or anywhere invite them to move on there to survive. When the affected people go to their relatives, they help them in different ways; to feed them for some days until s/he get work, to help them for hiring residence, to introduce them to the other people that help them to get work and to get daily necessary product from any shop. For example, if an affected man wants to pull a rickshaw anywhere in the city he will not get any rickshaw for pulling because he has not any relative or close person who can guarantee about him. On the other hand, most of the affected people lost everything and s/he has not cash money in hand as an advance that have to pay to hire residence. Relative or acquainted person helps migrants in these sections. But the question is if anybody has not any relative or channel what is his or her condition? He also can migrate and manage work, but he or she does not get such type of assistance that's why s/he has



to go through hardship. To overcome this hardship s/he has to lend money and has to pay high rate of interest against received money.

### **C. Changing food habit and taking low cost food**

In the crisis situation after eroding riverbank most of the people pass their time within very hardship and vulnerable condition. Scarcity of and insecurity to taking three times meal sufficiently in a day is a hard reality in the affected area. To adapt with the changing conditions, some families cannot take three times meal in a day. So they bound to change their food habit i. e. instead of taking three time meals in a day they take two or one time meal a day. On the other hand, they take cheaper food than before. Female members of the family play a significant role in this context. They arrange vegetable from the courtyard and rice from the home where they work as a maid servant. She supports her family in different ways at crisis moment. But the important thing is that the all members of the family try to take the cheapest food to minimize family income and management through the least amount of income.

### **D. Taking support from NGOs**

As riverbank erosion takes away everything of the affected people so they have to borrow money from NGOs or local money lenders. In both cases, they have to pay interest against the money which they have taken. But in some cases, both NGOs and the local money lender remit the interest for a particular period of time. But respondents feel free to take money from NGOs because they have some rules and regulations to give and take the money. Everyone is not able to get money from the local lender. And sometime they impose pressure to back all the money in a certain period. The interesting thing is that rich relatives and neighbors play important role in this context. If affected people take money from them, they do not have to give interest against the money. And payment system is comparatively flexible other than NGOs and other lending system.

Now a day NGOs play an important role to recover the damage and sufferings due to riverbank erosion. From disaster preparedness to evacuation they help the disaster induced people in various ways. According to the respondents, NGOs help the affected people in two ways; a) stop collecting their premium form the affected people for a certain period and b) give relief as primary response and give loan to restart the business and rebuild housing. Most of the cases they give the relief to their clients to strengthen their relation to the clients. But the relief is not enough for the people. In their client-protection programme, they allow clients to withdraw part of their savings, both compulsorily and voluntarily; and reschedule mandatory contributions until normalcy returns (Matin & Taher, 2001: 234). So they take loans from NGOs and try to build their house and restart their business. We can look at the case of Shetu.

### **Case # 1**

Shetu is a 16 year old boy. His father has been suffering from an acute disease for a long time. Now he is totally disabled to do anything. To face riverbank erosion in several times his family is completely empty hand now. He and his mother were catching the shrimp fry (baby shrimp) in the Padma River along with their small scale business. Catching shrimp fry is a seasonal work. They took it as a part time work.

Their main income came from the small business. But in riverbank erosion of 2018 it totally went to the river. They saved some money to an NGO to buy a piece of land to build house. But sudden riverbank erosion stopped the effort of building a house. They instantly withdrew all the money they have been saved in and took some money as loan to regenerate their income through buying an auto (a three wheeled vehicle). Now, the earning from auto driving is the main source of income for shetu's family. With the income shetu is managing his family and giving the premium against the loan.

## 7. Conclusion

Riverbank erosion is one of the severe natural disasters in Bangladesh. People affected by this disaster have to face different types of sufferings and vulnerabilities. People living in the erosion-prone areas have suffered from infrastructure damage and breaking social bonding that they have maintained earlier. Riverbank erosion has taken away all the belongings of the inhabitants of the study area. So they have to take different types of techniques and strategies. For example, they can not manage food for the members of the family. Even they had to take the cheapest food than they took before erosion. Being migrated people have been transferred in a short distance, to a neighbor's and relative's houses or any other nearby shelter centers as part of the response to emergency situations. But this is not the ultimate solution for their survival. Migration is an important strategy for their survival. But in which area they will be migrated is completely depends on whether they have close kin, friends, neighbors and the acquainted person or not. This type of channel of migration plays an important role in the survival of the affected people. If the government, in particular Water Development Board (WDB) and other responsible organizations, which have been working in this sector take timely and need-based actions to save the embankment in the high erosion-prone areas on the Padma River then the people can save them from these types of miseries. Policymakers should rigorously visit the area and take the point of view of the native people, who have been living in this area for a long time and have practical experience of coping up with the broken situation. It is impossible to cover all the issues related to riverbank erosion by any particular study. So further interdisciplinary study should be undertaken to explore the holistic scenario of the riverbank erosion and lessen the impacts.

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