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Impacts of Riverbank Erosion and Food Insecurity: Evidence from Naria, Bangladesh

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Abstract: The main objective of this study is to find out the sufferings and havoc carried out by riverbank erosion and how riverbank erosion hinders livelihood and limits the ability to ensure food for the family members of the affected people. Besides extensive literature review, primary data have been collected directly from the people of the riverbank erosion-prone area of Naria Pourosova and the adjacent locality using observation, questionnaire, Focus Group Discussion (FGD), In-depth interview, and informal discussion methods**.** Findings show that, immediately after riverbank erosion, the affected people have to face abnormal situations. The people lose their homesteads and cultivable land, including crops, and business enterprises, and become helpless overnight. That's why they have no alternative to migrating anywhere. All the vulnerabilities increase the food insecurity of the affected people. Policymakers can be benefited from these findings while formulating policy recommendations and strategies to support the people affected by riverbank erosion.

Keywords: Affected people; Bangladesh; Erosion; Food insecurity; Riverbank

1. Introduction and background of the study

Bangladesh has a long history of riverbank erosion. Extreme amounts of silt are being transported from the Himalayan Mountains to the sea through the Bangladesh delta, which is produced by the same soils. These fine soils are a breeze to transport and deposit since they have no resistance to running water. As a result, the behavior of huge rivers is highly unpredictable, and riverbank erosion is always a worry (Rahman, 2013). As the effects of climate change and hazards are starting to be felt worldwide, there are certain frontline countries that are most at risk and Bangladesh is genuinely at risk in terms of its economic viability and food security unless its citizens develop adaptation strategies to compensate for these effects (Alam, 2016). The socio-economic impacts of riverbank erosion are sticking as the numbers of marginalized peoples are increasing day by day. River bank erosion has become a common phenomenon along with the major and minor rivers in Bangladesh mainly due to deltaic topography and it has been forcing people to migrate or resettle in the area which is more vulnerable (Rana & Nessa, 2017).

Since the dawn of human civilization, man has identified hazardous environments around him and has tried to respond rightfully to cope with the problems arising out of such hazardous events (Das, 2011). There are enormous natural hazards occurring in Bangladesh. Riverbank erosion is one of the major natural disasters in Bangladesh and an issue of concern (Islam et al., 2017). Since Bangladesh is a riverine state, millions of its citizens are being forced to leave their homes due to riverbank erosion. 283 locations, 85 towns and growth centers, as well as 2400 kilometers of riverbank line in Bangladesh, are thus susceptible to erosion. Each year, thousands of people lose their homes and their

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land due to the major rivers, such as the Padma, Jamuna, and Meghna, which erode several thousand hectares of the floodplain (Islam & Rashid, 2011). People not only lose their houses and agricultural lands but also become displaced often permanently and impoverished (Iva et al., 2017). The effect of bank erosion is felt mostly on land while overbank inundation destroys standing crops, besides disrupting human habitat. As the flood region is extensively used for cultivation the bank erosion or bank line shift results in the loss of agricultural land. The effect is also seen in families in the village where their farmland and homestead are destroyed and have taken shelter on the embankment (Guite & Bora, 2016).

Different types of riverbank erosion can be observed every year in our country. Thousands of hectares of arable land go underwater due to riverbank erosion. Numerous people lose their homesteads by the extreme current of water. By losing all their possessions, they migrate to another place to resettle themselves. It is intensively connected to the food insecurity of those people. Firstly, they lose their house and land. Secondly, the farmer loses their crops existing in the field, and they could not cultivate their land for logging water for a long time. Thirdly, they are bound to migrate from one area to another to settle themselves. In the migrated area they are newcomers. So, they face different types of difficulties to adapt themselves to the new area. It becomes difficult for them to manage food for their family members. On the other, poor parents are unable to send their son/daughter to get schooling. So, the sons have to be involved in child labor to take responsibility for the family at an early age. And the parents get their daughter married off at early age. This situation limits their ability to get proper education and involve in any better job by which they can upgrade the situation of their families. As a result, they cannot change the fate of their family. They become the center of the poverty cycle; those have not any ability to get rid of this circle. For these causes, they face different types of hardship to secure food for themselves. So, this study wants to know how river erosion affects the regular life cycle of the inhabitants, how it impacts the socio-economic sphere of the affected people, and how this total system increases unemployment and poverty which affects their food security status.

2. Objectives

Bangladesh is a reverie country. In particular, the southern and middle part of our country is divided by numerous rivers. There are many villages situated on the bank of the river Padma. Every year a large amount of arable land goes underwater. The water not only increases in the rivers but also enters arable land. So, the farmers lose their crops. They cannot cultivate their land in time for standing water for a long time. Due to riverbank erosion and tidal water, they lose their homestead and other valuable resources. So, farmers always suffer from the uncertainty of managing the necessary food item for their family members. So, the objectives of this study are- (a) to find out the sufferings and miseries due to riverbank erosion, and (b) to know how the sufferings increase food insecurity of the affected people.

3. Research Methods

This study area is in a part of Naria Pourosova and the riverbank area of Kedarpur Union. The bank of the Padma River has been eroding for a long time, but the erosion that occurred in September 2018 on the bank side of Naria Pourosoava and Kedarpur union of

the Naria Upazila in Shariatpur was so catastrophic. Many government and non-government institutions like hospitals, schools, and mosques have vanished overnight. All the national dailies published reports on the catastrophe and devastation of the bank erosion of Naria. That's why this study has chosen these two parts of Naria Upazila as the study area on the basis of the severity of the erosion and suffering of the people. This is a mixed method study. Data have been collected by using both qualitative and quantitative methods. In the quantitative part, data have been collected through questionnaire interviews. Fifty respondents have been selected by random sampling. Due to the distance of the study area and the limitation of time, it would impossible to increase the sample size. As it is difficult to generalize about the riverbank erosion of the study area only based on the response of fifty people so this study also includes qualitative data to find out the ultimate scenario of the study area. Fifteen respondents have been selected purposively to collect qualitative data. Observation, IDIs, and FGDs have been used to collect qualitative data. Tow FGDs have been conducted as group forms consisting of six (group i) and seven (group ii) homogenous people, and two In-depth interviews have been conducted. During the qualitative data collection period, notebooks and diaries have been used to take notes. Qualitative data have been analyzed thematically and quantitative data have been analyzed by using SPSS software. Data have been collected at the last of 2018 and the beginning of 2019.

4. Literature review

Riverbank erosion is one of the most unpredictable and dangerous types of disasters, with factors such as rainfall, soil structure, river morphology, the geography of the river and surrounding areas, and floods all playing a role. Agricultural land and homesteads, as well as other livelihood possibilities, were evacuated as a result of the disaster, which cost less in lives but cost more in livelihood (Udiin & Basak, 2006). The marginalized and poor people not only lost property but also experienced socio-economic deprivation through displacement. Because of the dynamic character of the braided channeled river and the failure of structural measures, the sufferings of the people continue (Udiin & Basak, 2006). The impact of erosion on the natural resource and socio-economic condition of the displaced population was multilateral. On one side, it was eliminating the homesteads and infrastructure, damaging crops of the people, and on the whole, increasing poverty. Displacement not only exposes people to confront the challenges of surviving in a new and unpredictable environment, but it also removes them from the primary economic and social underpinnings on which their livelihood is built (Iva et al., 2017).

The value of the newly accreted char land is very low compared to the mainland. Thus, this hazard creates a great loss in the local economy. Within the studied time range the monetary loss is about 1414.81 million BDT (17,422,937.16 $). Many wealthy farmers of the study area turn into marginal farmers and even landless due to the erosion hazard. Agricultural land becomes barren land to huge siltation and the cropping pattern has changed significantly. In addition, the infrastructure and property losses are enormous (Bhuiyan et al., 2017).

Khan (2012) portrayed the socio-economic impact on the environment of Barpeta District of Assam in India. Most erosion and flooding incidents occur in Assam's Barpeta District. In the district, 80 villages have complete damage, and some others have minor damage.

Known for its river harbor, which in 1962 became a collector of chars, the Tarabari and Khola Bandha are the district's entrances. In the Brahmaputra Valley's semi-urban regions, Tarabari Bazar vanished. The Brahmaputra Valley now contains historical locations mentioned in well-known "Novel" Monumoties like Moinbari, Hadira Chaki Flora, and Chatla. In addition, other rivers like the Beki, the Velengi, the Chalkhaya, the Pashuianara, etc., and in the Mandia of Barpeta also cause erosion, which poses a serious threat to the local population. The Mandia Block of Barpeta, which has been plagued by different socioeconomic issues for the past 40 years, has seen a growth in poverty, unemployment, illiteracy, incorrect maintenance of health and education facilities, shifting population patterns, and shrinking land area. Impacts of river bank erosion are multifarious: social, economic, health, education, and sometimes political. The first and foremost impact is social, i.e., homelessness due to land erosion which compels people to migrate (Tuhin et al., 2014).

Baishyo (2013) described the impact of Baralia River bank erosion on Melkipara village of Hajo Revenue, Kamrup district of Assam, India. He stated that-It creates new landforms and changes their flow as a result of these actions. When it overflows its banks, it causes natural disasters such as flooding, erosion, and sedimentation, all of which have a negative impact on human habitation in the floodplain. The nature and frequency of these dangers have a big impact on the economic activities that take place in floodplains. Some areas of the floodplain have been flooded.

Blitz (2014) tried to outline some important issues that accelerate the 'location security.' He emphasized the place, environment, and human security. At the same time, he wanted to know how the affected people adapt to their own environmental issues and why they have to be migrated from their native village to another. He said that- "The vulnerability of the char dwellers is not limited to environmental risk but is also determined by social, political, and economic inequalities which are expressed in their lack of human, financial and physical assets. For this reason, interventions such as the Chars Livelihood Program are important initiatives to reduce vulnerability". Zaman & Wiest (1991) analyzed the problem of relocation for those displaced by riverbank erosion, as well as the conflict over control of the newly formed char island and the reallocation of land. The current research area's circumstance is entirely distinct from Zaman and Wiest's investigation. There is no disagreement here about char land. However, there is coherence among those who are impacted. And in the majority of situations, relatively wealthy people provide impacted people with a plot of land at no cost so they may build new homes or renovate old ones. Baki (2014) found some important issues regarding the impact of riverbank erosion on the livelihood pattern of the people living on the bank of Gorai River and policy issues related to riverbank erosion. He said that in most cases our policy-making and implementing system are based on the top-down approach. But it should be based on the bottom-top approach. In the meanwhile, he traced some governance issues that lessen the vulnerabilities of the affected people. He said policymakers and implementers should give importance to good governance and the benefit of the people who are living on the bank of the Gorai River. Chen et al. (2018) traced the impacts of riverbank erosion and the management by the affected people. He said that riverbank erosion resulted in social isolation, material loss, and forced migration. But affected people get less institutional support. At the same time, he emphasized how people lessen the vulnerabilities of riverbank erosion by raising their voices on social media like Facebook. Rahman & Islam

(2018) identified the impact of the Padma riverbank erosion of Hariarmpur under Manikgonj District. He showed the changing cropping pattern between mainstream lands and newly rising char lands in this area. According to his findings, Char dwellers are unable to cultivate the same species of crops as the people living in mainstream land. In his study, it is said that- "Bank erosion occurs sand carpeting and localized drought conditions reduce soil moisture, increase water stress and shrink cropping systems eventually decreasing yields that bring about food deficit and changes of food habit among the char people."

Roy et al. (2017) described the impact of riverbank erosion on the people of the Durgasagar Union of Bakerganj Upazila. It is evident from their study that to adapt to the vulnerabilities and sufferings of riverbank erosion most of the affected people have to migrate from their village to nearby cities. To maintain the expenditure of the family, at the crisis moments after erosion sometime they could not able to manage sufficient food for family members. They also identified the long-term consequence that affected people have to bear for a long time. Bhuyan et al. (2017) addressed the severity of the riverbank erosion of Harirampur Upazila in Manikgonj. They showed the difference between the economic condition of the inhabitants of the Char land and mainstream land. And give importance to how wealthy farmers turn into landless and marginal ones. It is evident that agricultural land become barren and the cropping patterns have dramatically changed. This also hinders the economy of the household. Das (2017) made categories of short and long-term consequences of riverbank erosion. According to him population displacement, loss of home, agricultural land, and joblessness are the short-term consequences. Poverty due to losing cultivable land, direct and indirect impacts on households, and health and sanitation of the affected mother and their children are part of the long-term consequences of riverbank erosion.

According to Alam (2017), Riverbank erosion has exposed vulnerabilities in two highly erodible districts, Shirajgonj and Tangail. According to him, riverbanks create a variety of vulnerabilities, including a negative influence on livelihood methods and access to food, water, and health care. He described the poverty cycle as having restricted access to food, which leads to insufficient calorie intake, putting the affected people at risk of being unwell. They couldn't afford good treatment since they were poor, so they were unable to join the workforce and earn a living. Haque (1988) identified the adaptation and adjustment strategies of the affected people of the Jamuna flood plain area of Bangladesh. It is found that both individual and community level adjustment strategies are important but strategies that are taken by an individual are more correct than community level. Hossain (2021) depicted the vulnerabilities of the female person due to disasters like riverbank erosion. He said that women have to face multidimensional disaster vulnerabilities as a result of structural social relations. They have to become double victims of disasters due to their subordinated position in social structure, poverty, and gender.

The riverbank erosion not only destroys the physical infrastructures but also impacts the psychology of the affected people. Many scholars have contributed to the riverbank erosion studied in various countries in the world. Scholars working in our country gave importance to major river erosion-prone areas of the country. A number of devastating

riverbank erosions have occurred in the middle part of our country, especially in Shariatpur and Madaripur districts. There is little research related to riverbank erosion. By giving importance to the suffering and survival strategies, this study wanted to find out the havoc and insecurity, riverbank erosion has carried out.

In the existing literature on riverbank erosion, some research has been done to know different themes of riverbank erosion. But specifically, there is a little study done on riverbank erosion of Naria, Shariatpur. According to the cultural relativism of Franz Boas, there is a difference in every cultural pattern. We have to look into these cultures on their practices from the native point of view. So, this research has found some insights into the riverbank erosion of Naria, Shariatpur. In the meantime, if it is possible to know about the cultural pattern and impact on the daily food consumption capacity of any particular group of people then it will be easy to take initiatives to rescue them from the havoc of riverbank erosion and take measures to minimize the effects on their livelihood. That's why conducting research on riverbank erosion in Naria is demand of time.

5. Theoretical Structure

Oliver-Smith (1996) emphasizes three general perspectives to describe hazard and disaster. He said that the behavioral response approach, social change approach, and organizational approach are importantly related to analyzing disaster-related sufferings and social reality. This research has found a relationship between disaster and these approaches. After riverbank erosion, a remarkable change has occurred in every sphere of the locality; from individual behavior to national-level relief activities. Sometimes, immediately after riverbank erosion, it is evident that social solidarity plays an important role in the evacuation and immediate sheltering process. This study has a relation to Oliver-Smith's approaches to disaster-related hazards (Figure 1)

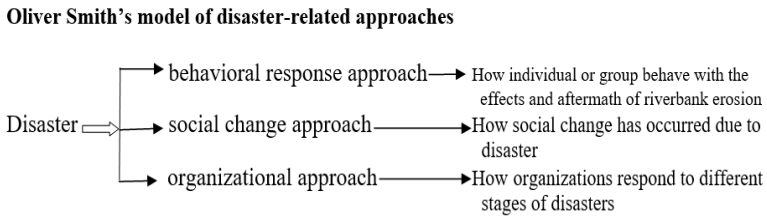

Figure 1: Oliver-smith's Model (Oliver-smith, 1996))

6. Findings of the study

6.1 Vulnerabilities due to riverbank erosion

Any natural disaster is destructive to the affected people. But riverbank erosion is more hazardous. Due to riverbank erosion, people of the bank area suffer in different ways. Sometimes damp and embankment have broken down and water enters into the locality. As a result, the farmer loses the crops, vegetables, and fish that they have cultivated on their land. Logging water for a long time destroys all types of cultivated crops that present themselves as famine. Agriculture has been affected by the riverbank erosion process (Bhuyian et al., 2017). Riverbank erosion has eroded all forms of infrastructure like roads and embankments, markets, educational and religious institutions, bridges, and

culverts. All these increase the vulnerabilities of the local people. Sometimes it is evident that incidents of being physically injured and even deaths have occurred when the affected people try to save themselves and their belongings during riverbank erosion.

6.2 Common diseases the respondents suffer from

Immediately after riverbank erosion, the affected people have to live in under open sky or in a tenant for some days. As all their infrastructures including tube wells and other sources of pure water broken down so they have to drink water from the rivers and other contaminated sources. They suffer from different cold-related and water-borne diseases. It is evident from the statements of the respondents that 89.58% suffer from cold-related disease and another 6.25% suffer from diarrhea or cholera. Another 2.09% of informants suffer from skin disease and the other respondents suffer from cough. It is clear that after being affected by riverbank erosion most people suffer from different diseases and they have to spend a big amount of money to get treatment.

6.3 Impacts on economy

Overbank inundation destroys standing crops and disrupts human habitat, while bank erosion has a predominantly land-based effect (Guite & Bora, 2016). Destruction of cultivable land and crops have a direct effect on the economy of the affected people who are living on the bank of the river Padma. Due to riverbank erosion and to rebuild their broken house, the wage earners of the family cannot go to any work for a certain period. Sometimes they migrate immediately after riverbank erosion. It is mentioned earlier that people in affected areas suffer from different diseases, like cold, fever, diarrhea, and cholera. So, they have to go to doctors to get treatment. To adapt to all the mentioned circumstances affected families have to suffer in two ways. On the one hand, they lost all their belongings and earning options. On the other hand, they have to spend a big amount to rebuild their houses and to set them up in the migrated area. These all have direct and indirect impacts on their economy.

6.4 Loss of cultivable and homestead land

The loss of homestead, which renders the inhabitants more vulnerable to living a decent life, is a serious consequence of bank erosion. People have no choice but to endure the consequences of erosion when it occurs. Before the erosion, they never move their homestead. The main reason for this is that they have insufficient earnings to rebuild their homes before they completely collapse (Uddin & Basak, 2006). Most of the informants of this study area had lost their arable land a long time ago. Findings indicate that only 4.76% of the respondent's main occupation is crop cultivation. On the other hand, 42.86% of respondents work as day laborers. But almost all informants have to lose their homestead land once, twice, or more than two times. The effect is so much disastrous to those families who lost all their cultivable land and home yard due to erosion and take place in embankment (Guite & Bora, 2016). The degree of riverbank erosion can be more or less, but the consequence is so much terrible. Many people become poor and landless overnight due to this devastating natural calamity. This has a direct impact on the economy of their livelihood.

6.5 Changes in income-generating activities

Income is completely related to and also dependent on occupation or work. When anybody's occupation or livelihood option becomes changed his/her income changes automatically. It is evident from the discussion of the earlier section that riverbank erosion carries miscellaneous vulnerabilities for the affected people. Migration is inseparably related to bank erosion. So, wage-earner members of the family are bound to change their livelihood options. For example, those farmers cultivate crops and vegetables on their land it is quite impossible for them to cultivate anything by losing the arable land due to riverbank erosion. So those farmers have to change their job. On the other, a dweller of the riverbank area may do the work of day laborers in the daytime and catch fish at night. After eroding all his belongings in the water of the Padma River there is no alternative to him without migrating. When he migrated to any city area it is impossible for him to continue his second job catching fish at night as there is no opportunity to do that. Now he has to do the work of a day laborer or have to pull a rickshaw or van. After being affected a master tailor becomes unemployed and has to work as a day laborer and a landlord becomes a beggar overnight.

6.6 Impact on social harmony

Despite the fact that most individuals have lost everything, there has developed a deep tie between neighbors, as if the entire neighborhood is one family. Their misery, the shared cause of suffering, and generations of battle have bonded and resilient them, and it is with this strength that they fight for survival (Chatterjee & Mistri, 2013). It is only sustained immediately after severe riverbank erosion when the neighbor comes forward to help the affected people in various ways. It is not a sustainable solution because almost every person in the bank area is affected more or less. It is impossible for them to help others for a long time. Another important thing is when the affected family rebuilds their house in their own village or near the village of their relatives then it is possible to maintain a supportive relationship with the affected family. But when a family migrated to another village far from their native village or from their close kin there this family is completely unknown to everyone. How they can get assistance from an unknown family or family members? Most of the time it is so much difficult to maintain good relations in terms of relief and assistance of govt. and other agencies. Furthermore, when a large number of the population have to be satisfied with limited resource then different types of problem arises among the community people.

6.7 Displacement and migration

Riverbank erosion has a strong link with migration and displacement. There wasn't a single case of riverbank erosion that didn't result in relocation or transposition. People migrate to locations where they have easy access, the opportunity of cultivating land, vital support from relatives, a wide range of job options, a better quality of life, and educational chances and essential needs (Bhuiyan et al., 2017). The stream of the Padma River wore homestead land, agricultural land, and pond and lost several other properties like homestead plants, tube wells, and crops of the victims within the study area (Ghosh & Mahbub, 2014). So, the affected people have no alternative way without displacement or migration to anywhere from the eroded area. This study also finds that migration and

displacement are the inseparable consequences of riverbank erosion. This will be clear from the statement of a respondent. Asman Ali, age 65, mentioned that "I migrated three times in my life due to riverbank erosion. After the hazardous erosion in 2018, I had to be displaced two times. Now my family lives in a house made on the land of a neighbor."

6.8 Impacts on livelihood

Riverbank erosion has enormous impacts on livelihood patterns. Due to the risk of erosion, there is no developmental or industrial setup in this area. The livelihood of the people mostly depends on agriculture or agricultural labor (Bhuiyan et al., 2017). All continents are more or less affected by river bank erosion. But its impact on the population varies as the socio-economic conditions are different for different regions (Das et al., 2014). About 93% of respondents have to change their livelihood options due to riverbank erosion. Among them, 64.58% changed fully, 18.75 changed moderately, and the remaining 10.42% changed their livelihood option partially. How riverbank erosion affects the livelihood of the people of the erosion-prone area is presented in the chart below.

Poverty is an inseparable part of riverbank erosion, as it carried out all the properties and other valuable resources. Almost every affected people lost a large number of arable and homestead land several times by inheritance. 84% of the respondents (42 out of 50) strongly agreed, and 12% (6 out of 50) agreed that riverbank erosion increases poverty among the inhabitants of the research area.

There are different causes related to this poverty. They have a previous linkage of riverbank erosion that hinders their prosperity. Again, they have to face the incidents of riverbank erosion that wash out all the things they have. It has direct and indirect impacts on the livelihood of the affected people. After bank erosion, it would be difficult for the wage earners of the family to go for earning. They have to try to rebuild houses or tenants for shelter. They have to lose crops cultivated in the field. Due to stagnant water, they cannot grow crops on the land in the next season. After riverbank erosion, people have to drink water from river and pond which increase the risk of being sick. To get treatment for the family members, they have to spend a sizeable amount of money which increases the economic vulnerabilities from the experiences for a long time; the informants said that riverbank erosion comes to us as an obscenity. They perceive this disaster as their bad luck, nothing else. Some aged respondents said that "it is our destiny otherwise we have not to suffer from this."

7. Riverbank erosion and food insecurity

Food insecurity in the places where people were displaced could be attributed to a number of issues. The main causes of food insecurity were a lack of education, a large family, and a low level of income (Islam et al., 2016). Riverbank erosion increases poverty among the affected people. A respondent said that "*By losing everything, my family, as like many other families in our locality, is suffering from acute effects of riverbank erosion. All the members are thinking about how they will make a living in the upcoming days. No one knows how they will manage the food items and other necessary ingredients. In short, we are in extreme uncertainty about ensuring food, pure drinking water, and other essential substance needed in our everyday life*."

7.1 Discussion

The enduring tradition of disaster research, especially in anthropology, regards disasters and natural calamities as challenges to social structure and organization and focuses on the behaviors of individuals and groups at different stages of the impact and consequences of natural disasters. Some elaborate profiles on the impact of direct disasters focus on the institutional settings in religion and rituals, technology, economy, politics, and cooperation and conflict models that emerged from the effects of and later (Oliver-Smith, 1996). Absolutely riverbank erosion is also a challenge for the individual and society. It also challenges the structure and organization of society. When riverbank erosion has occurred, it hinders the normal activities in the community. The poor and other community households were struggling to maintain and improve their livelihoods through the use of their traditional erosion control approaches despite the enormous losses of erosion, including socio-economic losses, agricultural land loss, reduced production, physical asset damages, migration, loss of homestead properties, etc. (Mamun et al., 2022). Migration is an indispensable part of riverbank erosion. Most of the inhabitants transform their housing from eroded areas to others. Not only these but also being affected by other impacts of the riverbank erosion society and social infrastructures become more challenged. To overcome these challenges, the behavioral responses of the individual and community level and community involvement are so much needed. Though immediately after riverbank erosion, it has seen that all the neighbors try to help each other by giving land for making houses temporarily on their land and food to the affected families. But in the long term, it is difficult to continue these types of support as there occurred a breakdown within the society because of different unavoidable circumstances. By facing hard reality immediately after riverbank erosion, the affected people have to go anywhere in search of their survival. That’s why the rituals, customs, reciprocity, kinship, and bonding with neighbors have broken down. It completely destroys the social harmony among communities. According to Oliver-Smith (1996), the impact of disasters on social and cultural transformation can also be significant. For a society to continue operating, new adjustments or arrangements may need to be made in the sense that a disaster undermines or destroys that society's capacity to provide, however unevenly, for the needs of its members. That’s why anthropologists apply the social change approach to analyze the changes that occurred in different organs of society.

Sufferings after riverbank erosion are the combination of losses of different resources. Due to riverbank erosion, almost all the families lost their arable and homestead land. That increases their anxieties and uncertainty about the future. And it hampers their flow of taking crops cultivated in the field. Another issue is changing earning options due to the breaking down of business enterprises and being migrated to a new area. It also works as a driving force to increase their suffering in terms of income. Interruption in income accelerates their vulnerabilities in all other aspects of their life. Sometimes it is seen many people become injured physically and dead during riverbank erosion. If the household’s head becomes injured or dead then their sufferings increase extensively. This type of family becomes helpless and cannot afford the expenditure of their family. After riverbank erosion, one of the acute problems is the scarcity of pure drinking water. It increases the vulnerabilities in healthcare sectors. By drinking contaminated water and using an unhygienic latrine, inhabitants of the newly resided area become sick. To

overcome these limitations and adapt to the hazardous situation, the affected families have spent more money, time, and effort. Relief activities from the government and other NGOs, and private organization is so much beneficial to the affected people immediately after riverbank erosion. But getting the relief accordingly often depends on the nature of the relationship s/he has with the local political leaders. As a result, many vulnerable people have no access to get relief from the concerned departments and institutions. To overcome these situations organizations and institutions need to be more active to ensure the facilities for managing the fragile situation. That's why Oliver-Smith suggests the organizational approach to analyze the post-riverbank erosion situation of the community. All the abnormalities and inconsistencies described above directly or indirectly affect the continuity of the affected people. There is a relationship among some inseparable issues of their life. Such as livelihood options, economy, income, affected by diseases, rebuilding their house, losing crops, migration, and breakdown in social harmony. In summary, all the aspects hamper their economy, and as a result, their situation degraded gradually. Consequently, economic vulnerabilities affect their food-taking capabilities. How this situation increases food insecurity is summarized in the figure below.

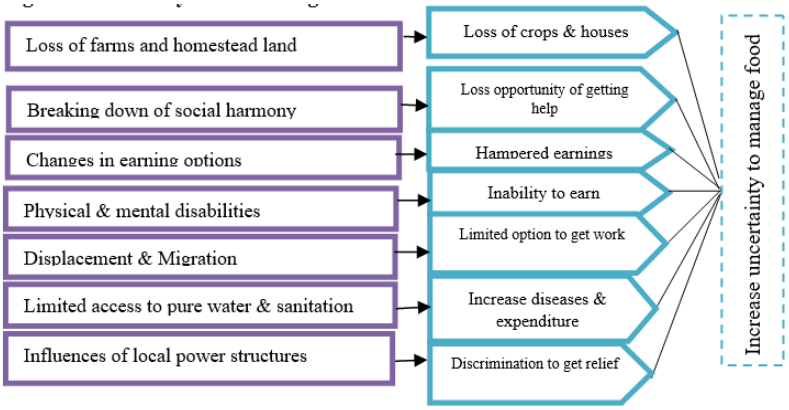

Figure 2: Summary of the findings

8. Conclusion

Riverbank erosion doesn't carry any single suffering but encompasses multiple misfortune to the affected people. Immediately after riverbank erosion, the people of the affected area suffer from a lack of residence. They have to live under the open sky, have to suffer from various diseases due to drinking contaminated water. That's why community people suffer from different serious diseases and spend a big amount of money for treatment purposes. Riverbank erosion erodes arable and homesteads land and washed away all the crops on the field. This hampers the affected people in two ways. Firstly, all the crops on the field were washed away by the erosion and surge of water into arable land. Secondly, due to riverbank erosion, people lose their cultivable land so which limits their opportunity to cultivate the land further. By losing their land they have to migrate anywhere to resettle themselves. So, it becomes impossible for them to continue their previous occupation. Consequently, the loser has to change his income-generating activities. But it is difficult for most of the migrated people to manage jobs/work soon

after coming to the migrated area. It hampers their income. There is a local proverb about the devastation of riverbank erosion 'If it burns there are ashes, if it is theft there are houses, but because of the erosion of the riverbank, nothing remains.' All that effects affect their daily food-ensuring capacity. That's why riverbank erosion integrally interrupts the food-taking ability of the affected people.

If the concerned departments and authorities take proper actions, then the erosion may be stopped. The initiatives should be practical and need-based. The respective ministry and divisions/departments have to be cautious before coming to the extreme riverbank erosion occurring season. Different volunteer groups have to be formed before riverbank erosion to evacuate the affected people and their belongings. Government, NGO, private, and volunteer organizations have to distribute relief immediately after life-threatening riverbank erosion so that the affected people can survive by taking the relief goods. During the post-erosion period, the government has to take initiatives for the affected people to reconstruct their houses and give soft loans to re-establish their business enterprises. After all, the government has to take short, medium, and long-term initiatives for a sustainable solution to riverbank erosion. 'Left no one behind' is the ultimate objective of the Sustainable Development Goals (SDGs). So, if we want to make development sustainable or development for all, then we have to consider the sufferings of these affected people with importance. If the authorities make policies according to the needs and demands of the people living on the bank of River Padma, then it would be possible to solve the problem of riverbank erosion sustainably. So, to reach this goal, further research is required in this regard, which would guide us to identify the justifiable solution to this problem and possible ways out of the miseries of the people living in the riverbank areas.

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