

SOCIO-ECONOMIC IMPACTS OF RIVER BANK EROSION ON DURGAPASHA UNION IN BAKERGANJ UPAZILA, BANGLADESH

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Abstract

The purpose of the study was to identify socio-economic impacts of riverbank erosion on Durgapasha union in Bakergonj Upazila. River bank erosion hazard is a regular phenomenon in Bangladesh. Every year thousands of people are being displaced from their homes and land properties and are being permanently homeless and destitute. Durgapasha is the most vulnerable area to erosion. A questionnaire survey was conducted for data collection method. Loss of homesteads, agricultural lands and agricultural productions were collected through semi-structured questionnaires survey. The riverbank erosion has long term impact on livelihood and changes the livelihood pattern of people. Decreasing the family expenditure of most of the people could not get daily needs of food which has indirect impact on health. Maximum displaced people are now being migrated to nearby cities for searching job and they are involving themselves into hazardous works.

Keywords: River bank erosion, Socio-economic impact, displacement.

Introduction

Background

Bangladesh is a riverine country and is located at the junction of the three river

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systems called the Padma, the Jamuna and the Meghna. Most of the major rivers of the country are trans-boundary rivers which have come to Bangladesh through India. Riverine Bangladesh accommodate water flows originate from Himalaya as well as Indo-Burman Ranges that carry a lot of sediments as blessed event for human civilizations and agricultural land from prehistoric time. On the contrary, excessive flow of water through river channel create hazard to the bank of the river channel by river bank erosion. This phenomenon directly erodes the bank and displaces human civilization and damages agricultural land.

River dynamics are controlled by the water flow and volume of sediment pass through the channel as well as climate and tectonics of the river flow regime. River naturally changes in intensity and magnitude and tend to be in equilibrium conditions by erosion and deposition. When stress of water and sediments exceed the resistance of the bank, erosion occurs (Islam and Rashid 2011). Erosion of the one bank in the river leads to the deposition of another bank. These all are related to the flood and riverbank erosion (Elahi and Rogge 1991).

Flood and river bank erosion are the main disaster's formed from these rivers. Although river bank erosion are considered as one of the most annoying environmental hazards these days (Chatterjee 2013). The victims of the river bank erosion are most likely to suffer from the emergency operations. Impacts of river bank erosion on human are multidimensional (Haque 1988). The invariable threat of the bank erosion was contributed to a substantial disaster subculture in the riverine zones Bangladesh (Hutton and Haque 2004). So, it is evident that a major part of the total population of the country lives near riverbank which frequently makes them victims. One million people are affected directly every year and about four million homeless people are being compelled to lead a suspended life (Islam and Rashid 2011). Displacement due to river bank erosion is a persistent and recurring hazard in Bangladesh (Hutton and Haque 2004; Mamun 1996; Rahman 2010; Zaman 1986).

Population density is increasing over time as river bank erosion is progressively affecting more and more people (Indira 2013).

Bangladesh is suffering from severe river bank erosion (Mollah and Ferdaush 2015; Rabbi *et al.* 2013; Uddin and Rahman 2011). Rogge (1991) stated that the victims in Bangladesh have been suffering from the lack of institutional response in formulating and undertaking the adjustment strategies.

The study area is situated on the bank of the Tetulia river, Durgapasha union, Bakerganj Upazila (Fig. 1). The river is losing its depths gradually and bank erosion is accelerated day by day. People of the Durgapasha union faced heavy socio-economic problems due to river bank erosion. The erosion is still continued and they are losing their homesteads, educational institutions, cultivable lands and the main communication roads gradually. River erosion has changed the life pattern of many people of the area. Losing livelihood many people were compelled to look for alternative sources of income. People are taking shelter in nearby rural areas, khashlands etc losing homesteads and most of the affected people are being migrated to urban and sub-urban areas. Enough initiatives are not taken for the settlement of the displaced people. Considering the above problems this study has been carried out to reveal the actual picture of the adversely affected southern part of the country especially in the bank of the Tetulia river which is very close to the sea.

The present study is aimed to (1) find out the socio-economic impacts of river bank erosion and (2) to identify the problem due to erosion induced displacement in Durgapasha union, Bakerganj Upazila, Barisal. Several recommendations have been suggested by studying the numerous field data and interviewing to the victims so that policy makers as well as government can take proper initiative to reduce and mitigate the social and economic losses. The study is located in the eastern part of the Bakerganj Upazila and southern part of Bangladesh (Fig. 1). Durgapasha is a union of Bakerganj Upazila of Barisal. Geographically the area covers 23.70 km² with a population of 16 thousand having 5% literacy rate.

Materials and Methods

The method of the study is totally depended on primary source. Some data are collected from secondary sources. The socio-economic impacts of the study area were identified by visiting the affected area and evaluating the condition of affected people. The primary data collection process by the study team was to identify 60 vulnerable households who were displaced for 1-2 times and are now living along the river side. A semi structured questionnaire form had been made to collect the household's data. Among the 60 vulnerable households, 57 households are male headed and 3 are female headed. Few primary data were collected from the community representatives, local community focus group discussions and key informant interviews with knowledgeable persons of the locality (Fig. 2).

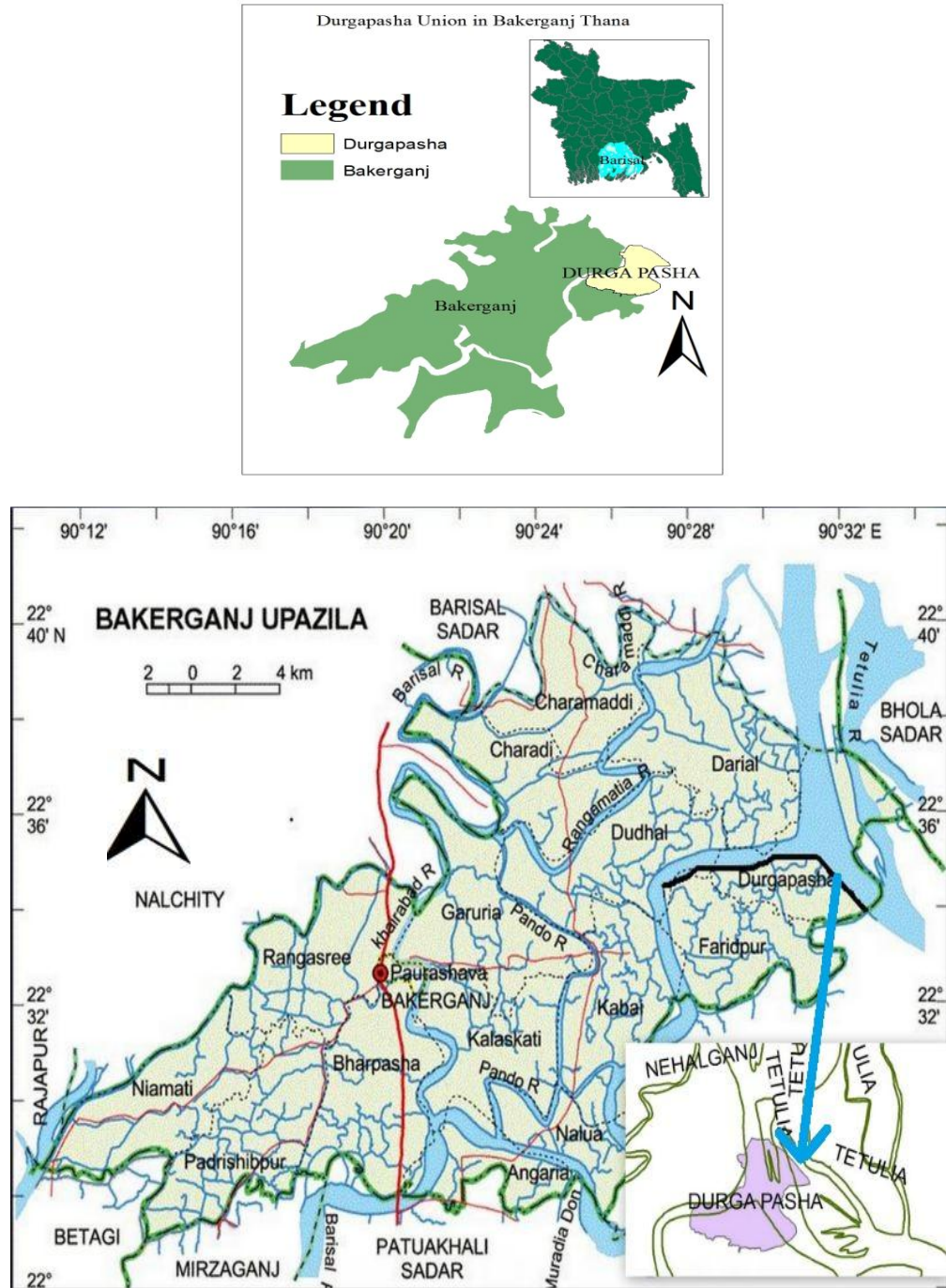


Fig. 1. Location map of the pre study area.

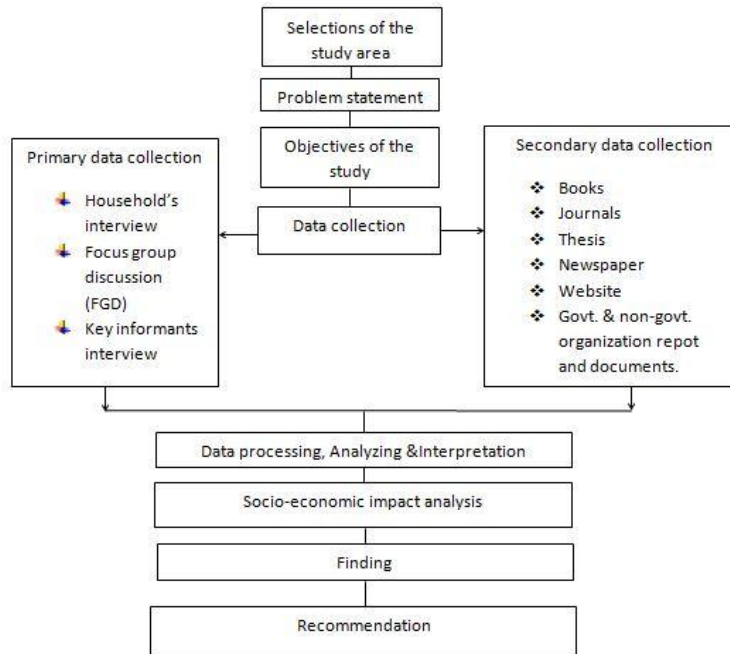
Outline of the Study

Fig. 2. Overall approach for the assessment method

Primary data collection process*Household's interview*

For collecting primary data open and close ended questions has been formed to survey every household (Sample questioner form ANNEX 1).

Focus Group Discussions (FGD)

FGDs were conducted to collect the validate data during the fieldwork of the research. In this purpose eight FGDs were conducted with vulnerable people of that area. During the discussion sessions following questions were asked to them:

1. What are the main causes of bank erosion?
2. How many years ago the erosion started?
3. What is the economic impact due to bank erosion?

4. How much the educational sector has hampered?

5. How many people are being migrated?

Key informants interviews (KII)

Key informant interviews were conducted by qualitative person including community representatives, school teachers and older villagers who has firsthand knowledge about the concerned issues. Eighteen key informants interview were conducted in the field survey.

Result and Discussion

Scio-economic parameters of sample households

Age of respondents

Among 60 household respondents aged 15-27 years is only 7% and 26-45 years is only 40%.The highest number of respondents is between 46-65 years followed by 41%.rest 12%respondents are above 65 years.

Gender Distribution

Most of the respondents are male and they are 95%.Only 5% are female among the respondents.

Education level of the respondent

About 23% respondents are illiterate and 77% respondents are literate. Only 7% of the respondents have received an education of graduate level or above 42% have studied up to higher education and 28% respondents are not able to get education up to primary level.

Occupation of the respondents

Among the respondents major portion (39%) is engaged in fishing. About 19% are involved in farming. Only 28% respondents are involved in business sector and very little (5%) are playing role as day labor. Only 9% respondents are involved in teaching profession.

Family members of respondents

It is estimated that most of the respondent's family is consisted of 6-8 members and its percentage is 62%.Only 21% families are found as happy family because these families are consisted of 1-4 members.17% families are found as so vulnerable because

of their 9-12 family members.

Housing pattern of the study area

Respondents housing structure

The structure of house pattern is more vulnerable due to bank erosion. The stronger the housing structure the lesser the vulnerability of erosion. People of the study area know that their house can be evacuated at any time. For that reason, they construct their houses with such building materials that can be relocated within short periods during disaster. Such provision makes them less vulnerable in managing the cost of housing. During the study, it was observed that among all sample houses 85% houses are kacha and rest 15% houses are semi-pucca.

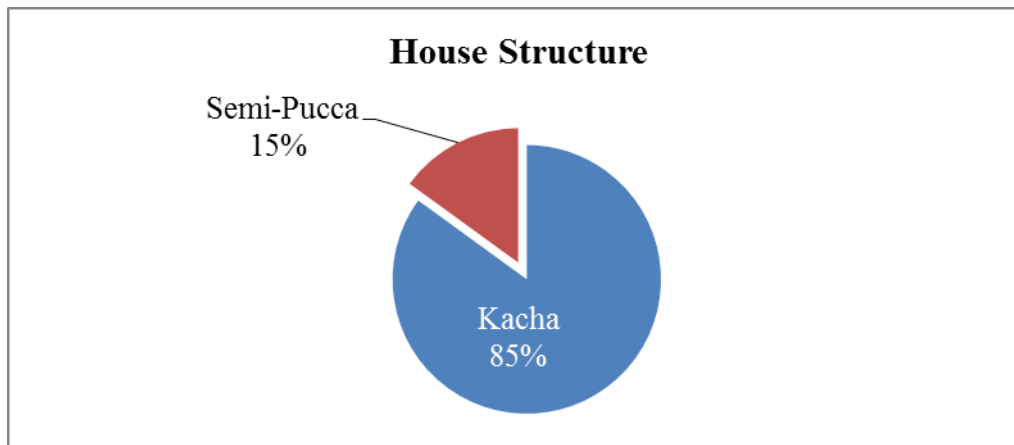


Fig. 3. Housing structure (Source: Field survey, 2014).

The severe impact of bank erosion is the loss of homesteads that makes the population more vulnerable to live a decent life. When erosion strikes, people have no option to leave behind except bearing the losses. They never change location of their homestead before the erosion takes place. The main reason behind such behavior is that they have little earnings that never allow them to replace their homesteads before it is totally collapsed.

Respondent's households distance from the river

Bank erosion has been causing great miseries to thousands of people every year living along with the riverbanks. Those who live very close to riverbank are more vulnerable to erosion. An attempt has been made to understand the locational factors which make them vulnerable to disaster.

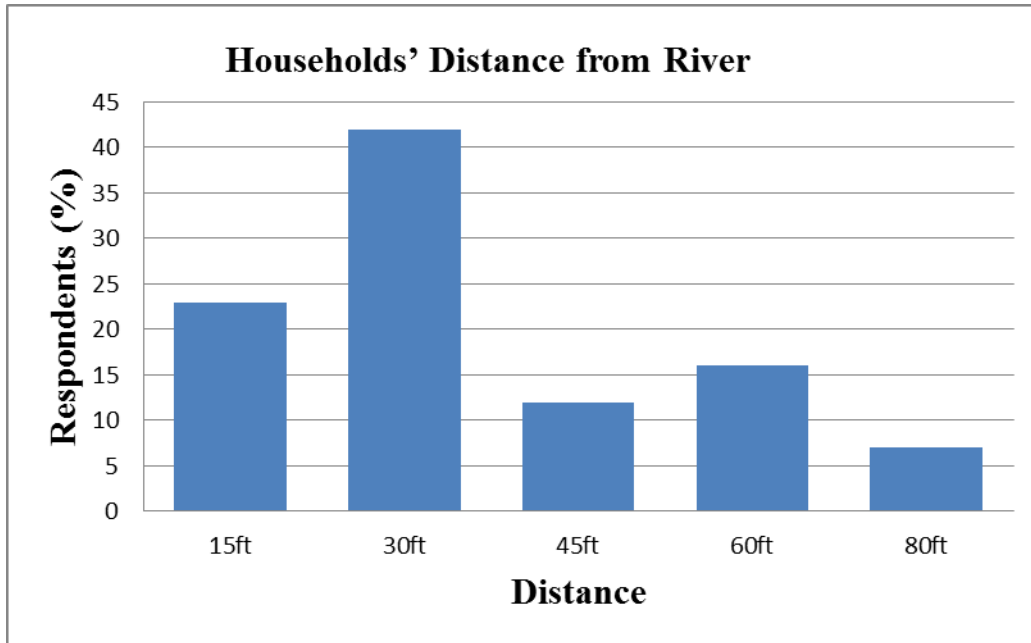


Fig. 4. Households distance from the river (Source: Field Survey, 2014).

It is found that 23% of sample households are very close (15ft) to river bank. In Durgapasha, 42% of the households are at a distance of 30 feet (Fig. 4). These households are located in such a distance that erosion may displace them within one year erosion. On the contrary, 16% of people in Durgapasha reside more than 60 feet from the river. 12% respondents' household distance are 45 feet from the river. Rest, 7% respondents household distance are 80 feet. However, those who reside along with bank line are also facing this disaster more acutely.

Socio-Economic impacts of river bank erosion

Socio-economic impact of riverbank erosion has created various disastrous socio-economic effects. Riverbank erosion is perceived as a natural phenomenon by most of the affected people but in many cases the people believe erosion to be the 'will of God'. However, these days, riverbank erosion is seen as one of the major causes for national poverty (Rahman 2010). The economic impacts of the river bank erosion are conveyed in the reduction of the agricultural lands which is reflected in declining the productivity of land and consequently decreasing income generation from agriculture exercises. The impact of land loss involves primarily the loss of homestead lands, agricultural lands, agricultural productions, crops and trees. Livelihood status of people of that area has changed due to the impact of property losses.

Loss of Homestead areas

From the field survey it has been found that the sample household respondents have lost huge amount of homestead areas. Maximum respondents told that they had expended their most of the savings to rebuild their house again and again. In spite of knowing that the house which they are rebuilding will not exist after one or, two years they are rebuilding their new homesteads near the river because they don't want to move anywhere from their own land. Estimating the homestead area losses of the sample respondents it is found that they have lost 90.47 acre homestead areas (Annex 2).

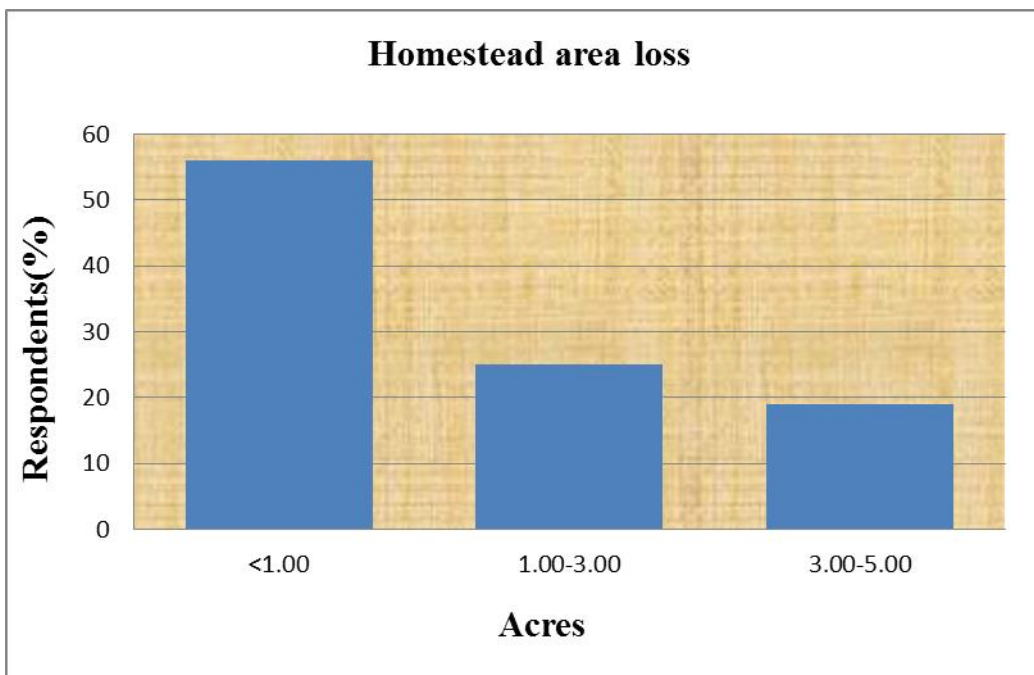


Fig. 5. Loss of homestead area (Source: Field Survey, 2014)

In the survey data it has been observed that 56% respondents in the study area have lost <1.00 acres homestead area. 25% respondent's opinion is that they have lost 1.00-3.00 acres homestead area. Only 19% respondents have lost within 3.00-5.00 acres of homestead area.

Economic loss of homestead areas

In the study area the economic loss from destruction of areas besides with homestead is 271.41 lakh (Annex 2). Most of the houses are constructed with bamboo and straw and the average cost of housing is 6000 BDT.

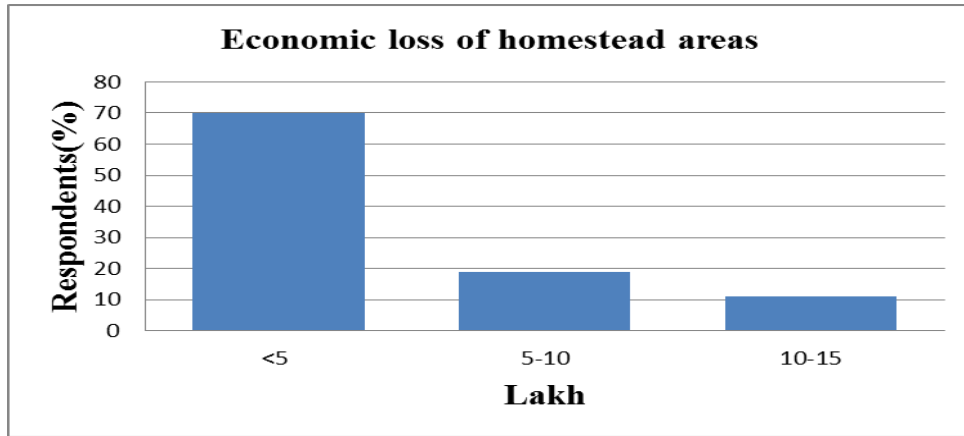


Fig. 6. Economic loss of homestead areas (Source: Field Survey, 2014).

Empirical data shows that almost 70% respondents have lost less than 5 lakh taka from the homestead area loss. 19% respondents opinion is they have lost within 5-10 lakh taka due to erosion. 11% respondents have lost 10-15 lakh taka.

Loss of Agricultural Land

Most of the people in this country directly or indirectly depend on the agriculture. In rural areas agriculture is the main source of income in Bangladesh. Agricultural land is the vital resource for the people living in rural areas and those who are living close to the river bank. Most of the people in the study area were engaged in agricultural sector but the situation is totally different. They have lost total agricultural lands which is the main source of earning. Evaluating the agricultural land losses of the sample respondents it is found that they have lost 314.48 acres (Annex 2).

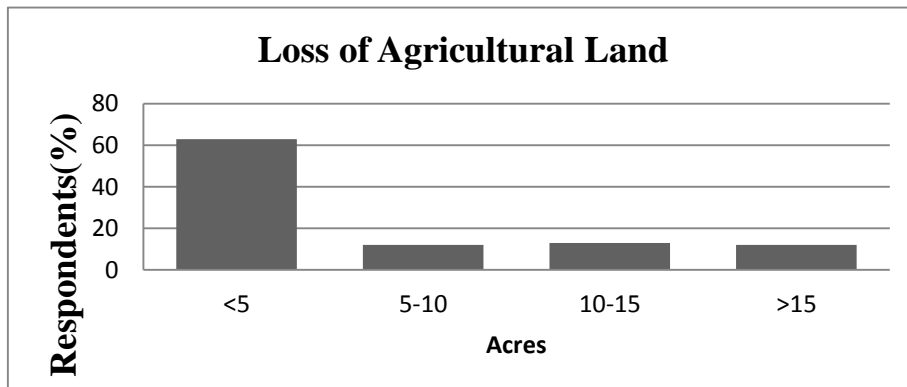


Fig. 7. Loss of agricultural land (Source: Field Survey, 2014).

It is evident from the study that almost 63 % of the sample respondents of the study area have lost less than 5 acres agricultural land (Fig. 7). On the other hand 12 % respondents in the study area have lost 5-10 acres agricultural land. Empirical data also shows that 13% respondents of the study area have lost 10-15 acres agricultural land. 12% respondents have lost more than 15 acres of agricultural land.

Economic loss of agricultural land

Agricultural land losses are mainly responsible for vast economic losses in the study area. The sample respondents' agricultural land loss estimation shows that they have faced 786.20lakh taka (Annex 2).

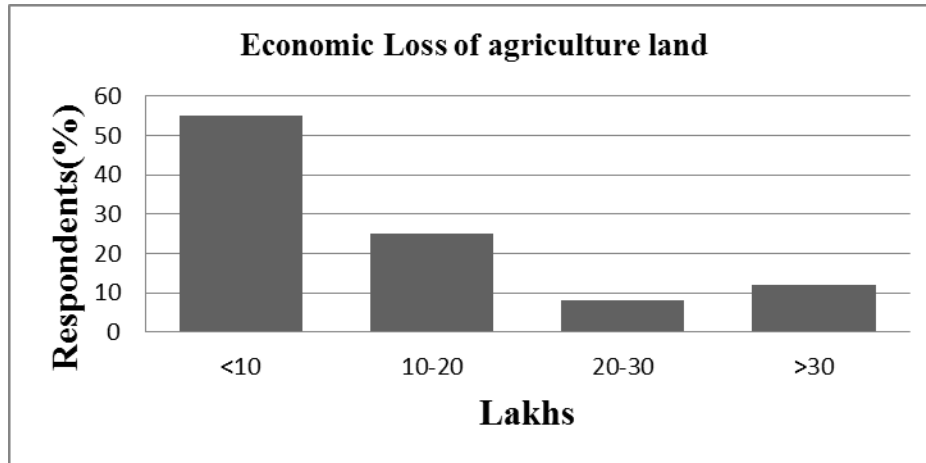


Fig. 8. Economic loss of agriculture land (Source: Field Survey, 2014).

The survey data shows that 55% respondents of the study area have faced economic loss under 10 lakhs. On the contrary 25% respondent's opinion is that they have lost 10-20 lakhs approximately. 8% respondents have lost 20-30 lakhs taka. Rest 12% people have lost more than 30 lakhs priced agricultural land. Once upon a time majority of the people of the study area was totally dependent on agriculture. Among them who had more agricultural land earlier than they are still running their cultivation and the poor are already migrated in fishing sector due to their losses of agricultural land.

Loss of Agricultural Production

A vast area of agricultural land goes into the river due to bank erosion. To calculate the losses of agricultural production of the study area, different crop production in a calendar year was taken into consideration. It is evident from the study that areas under investigation have limited opportunities of cultivation now. They can cultivate two

(Rice, Pulse) crops in a calendar year. The main cause of such limited cultivation is abnormal flooding and associated bank erosion.

In the field survey the sample respondent's perception is that they produce 40 maunds rice per acre of agricultural land. In that time the price of per maund of rice was 500 taka only. Every year they earned 20000 taka from their rice production. The costing was 8000 taka /acre land/ year and they were able to make profit only 12000 taka. But at present they are unable to earn that amount of money from the rice production due to losing their cultivable lands.

From the above mentioned discussion, it is found that most of the respondents have lost their homestead lands, agricultural lands, and agricultural productions. Such types of loss have reduced the opportunities of employment, which is one of the indirect impacts of disaster. People who were engaged in the agriculture sector had totally lost their earning source. Having no other sources of earning they have involved themselves in fishing sector for primary income source. In the adverse situation most of the erosion displaced people have to migrate themselves temporarily to nearby cities and engaged themselves in hazardous works.

Decreased family expenditure due to the river bank erosion

Due to the river bank erosion the source of the income has decreased. Once agriculture is the main source of income of the people but now the situation is totally different.

Monthly Income

Maintaining a minimum standard of living is the ability of an individual respondent. But their standard of living is being lowered by lower monthly income and being unable to cope with severe losses due to any natural disaster.

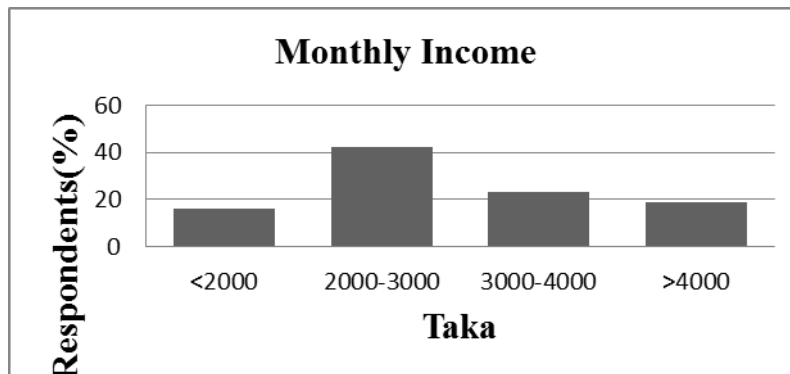


Fig. 9. Monthly Income (Source: Field Survey, 2014).

Empirical data shows that about 16% of the respondents' monthly income is less than 2000 taka. Almost 42% respondent's opinion is their monthly income 2000-3000 taka. 23% respondents perception is their monthly income 3000-4000 taka. Only 19% respondents of the study area have monthly income are greater than 4000 taka (BDT). It is clear that the highest number of the population (77%) of the locality is generating low income.

Expenditure for food

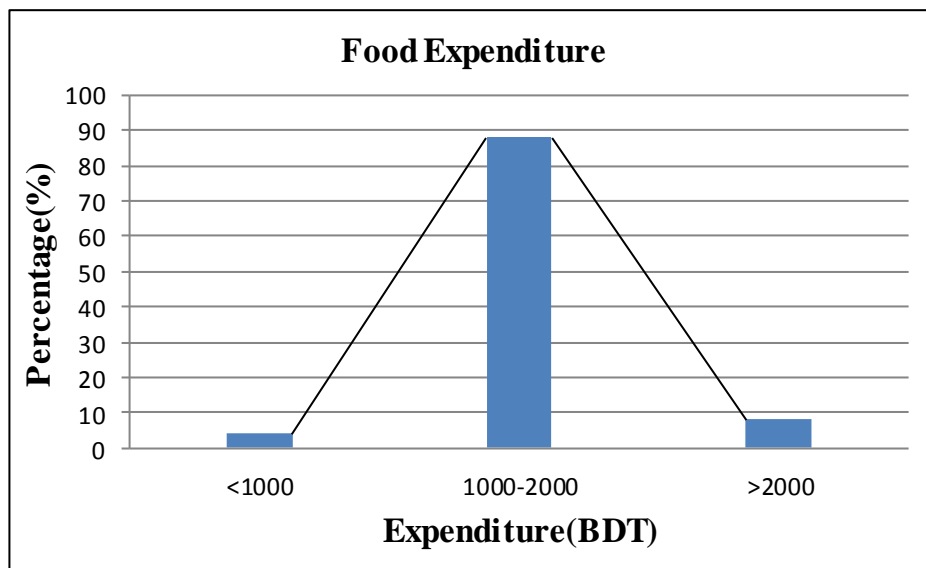


Fig. 10. Monthly food expenditure (Source: Field Survey, 2014).

Empirical data shows that 88% of the sample respondents spend 1000-2000 BDT for food consumption from their monthly income (Fig. 10). About 8% respondent's food expenditure is greater than 2000 BDT and 4% respondent's expenditure is below 1000 BDT. Such expenditure is inadequate most of the time because of large family size. Apart from this, when disaster strikes, their income level drops in a substantial amount that compels them to take food for once or twice a day.

Expenditure on Educational Sector

Education makes a man competent to serve the nation as well as running his life with full rhythms of happiness. An illiterate man, in most cases, is occupied by primary economic activities with little knowledge on how to improve or modify his activities. When disaster strikes, most of them do not know what to do or how to cope with losses.

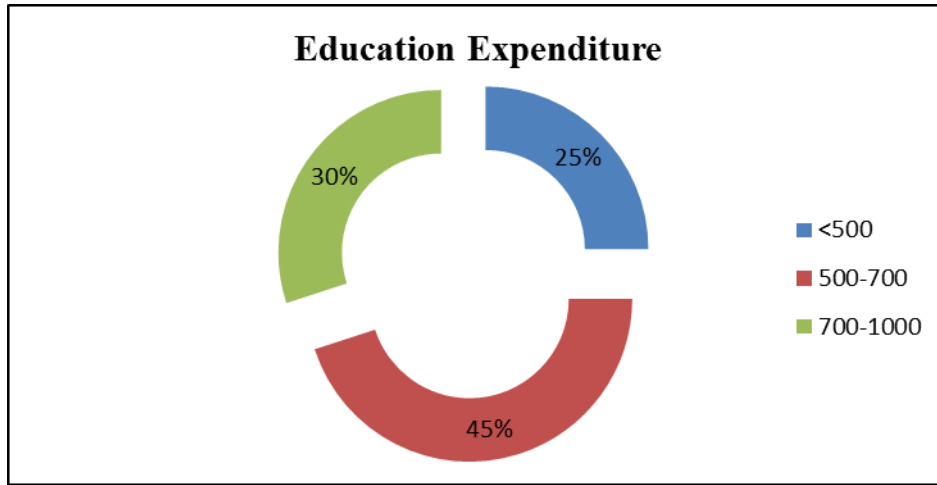


Fig. 11. Monthly education expenditure (Source: Field survey, 2014).

From the study it is evident that almost 45% of the sample respondents spend 500-700 (BDT) money for education. Such a situation indicates a very poor livelihood status of the study areas. On the other hand, 25% of the respondents invest below 500 BDT for education in the areas. Only 25% respondents spend 700-1000 (BDT) for education sector. To improve livelihood status and to increase the income level, education is the ultimate choice, and people have to pay more attention in this sector.

Expenditure for Health Care Facilities

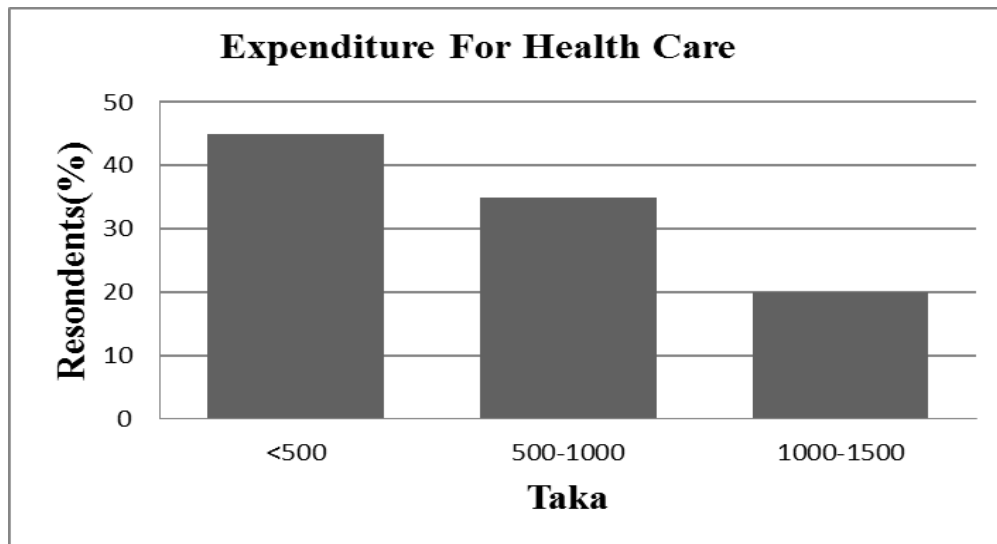


Fig. 12. Expenditure for health care (Source: Field Survey, 2014).

To maintain a decent life and to perform the economic activities efficiently, health is the prime factor. Due to lack of having sufficient food most of them suffer from malnutrition.

Empirical data shows that a vast majority of sample respondents 45% expend 500 BDT for seeking health care facilities. Very few of them (28%) have the ability to spend more than 500-1000 BDT per month in this purpose. 20% population in the study area expends 1000-1500 taka (BDT) for health care facilities.

Problem Due to Displacement

Displacement is the immediate impact of riverbank erosion. The displaced usually move to nearby areas but migrations to distant places are not uncommon. The maximum displacement found 6 times which was the highest in number among the sample respondents.

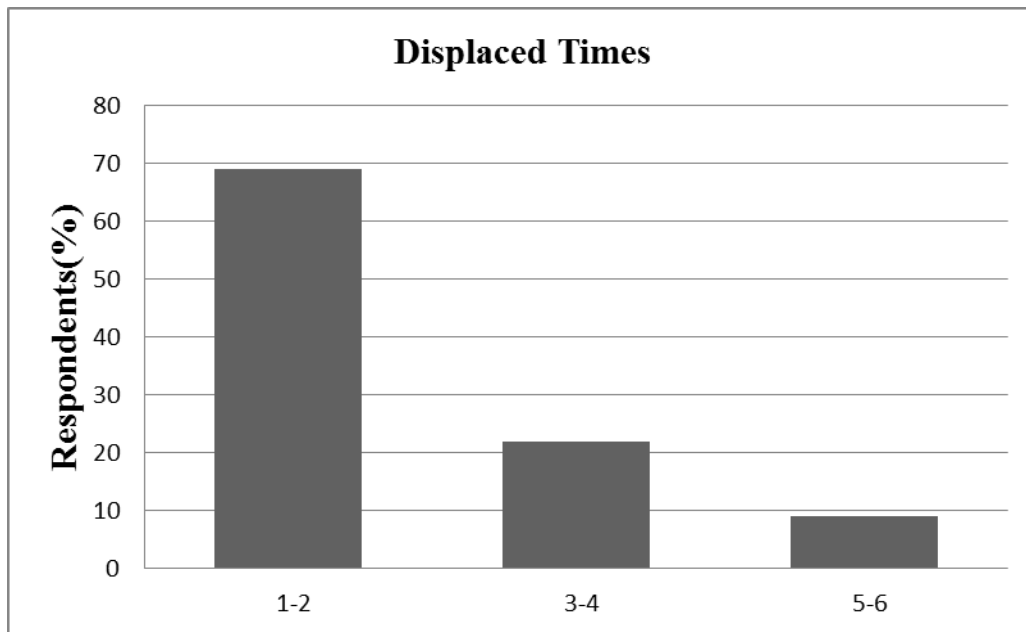


Fig. 13. Displaced times (Source: Field survey, 2014).

In the study area it is found that almost 69% respondents were affected 1-2 times (Fig. 13). On the other hand 22% respondent's opinion was that they were displaced for 3-4 times in the area. Only 9% respondent's perception was that they were affected 5-6 times. It is very much impossible to bear their livelihood from the erosion.

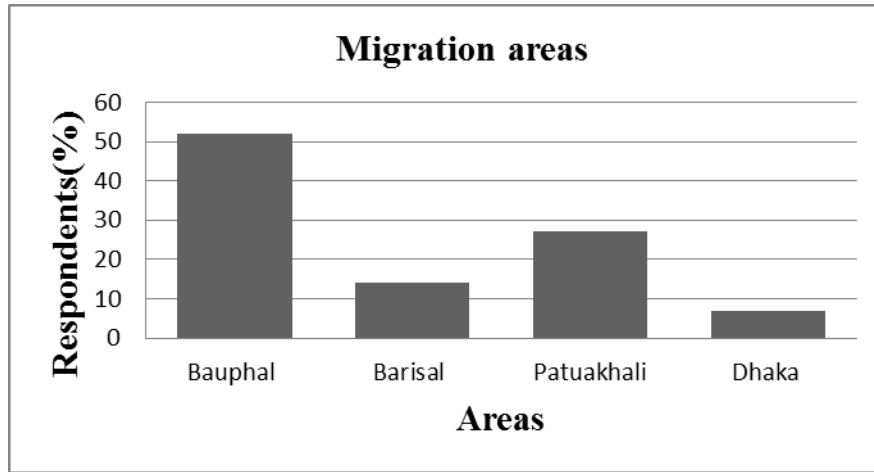


Fig. 14. Migration areas (Source: Field Survey, 2014).

From the field survey it is estimated that 52% displaced people have migrated to nearby Bauphal Upazila. Near about 27% displaced people have migrated to Patuakhali district. Only 14% displaced people have migrated to Barisal Division. Rest 7% migrated to Dhaka for better opportunity.

Findings of the study

- i. Affected people of the study area have stated that the income erosion has changed the life pattern of the people. Most of the displaced people are badly facing the low income and their monthly income is 2000-3000 taka. This low monthly income cannot fulfill the daily basic needs of the people.
- ii. Most of the houses (85%) in the area are kacha.
- iii. Once agriculture was the main income source of the people but now the situation has totally been changed because of losing total agricultural land. Now most of the people have engaged themselves in fishing sector to maintain their family.
- iv. The study finds that 50% people of the study area are vulnerable for river bank erosion because they live near the bank line.
- v. About 70% people of the study area have lost at least 5 lakh taka for their homestead loss.
- vi. About 63 % people have lost 5 acres agriculture land and 55% people monetary losses are 10 lakh taka.
- vii. Most of the people have lost high amount of agriculture production which is the prime need to maintain their daily life.

- viii. About 88% people perception is that their monthly food expenditure is 2000-3000 taka.
- ix. In education sector 45% people monthly expenditure is only 500-700 taka.
- x. About 69% people of the study area have been displaced for 1-2 times. People who have displaced for 5-6 times are now living in Government road.
- xi. The study has found that 52% people are now being migrated to nearby Bauphal upazila as well as the big cities in Bangladesh.

Conclusions

Durgapasha riverbank erosion is not a recent phenomenon, the people of the study area has been experiencing high river bank erosion since last few decades. Many families of the area who were totally dependent on agriculture had lost homesteads and agricultural productions which made them socio-economically vulnerable. Due to facing great economic problem the expenditure of food, health and education has been lowered of the affected people in the area. Having no way for sustaining desirable life due to erosion the displaced people are being compelled to be migrated to nearby areas. Reducing the socio-economic impact structural and non-structural measures should be adopted.

- I. Riverbank erosion is a regular phenomenon in the country. Now the problem is highly acute because of the siltation of the river bed losing its depth and eroding banks. Comprehensive management policy should be made nationally.
- II. The relief and rehabilitation programme for the displaced should be taken immediately. Minimum khash lands should be given loan with low interest rate.
- III. Many affected people suffer from low income. So the affected people should be given loan with low interest rate
- IV. Illiteracy is increasing day by day in the area because of no provision of sufficient education institute. So the local leader as well as the Government representatives should take good initiatives to manage it.

Acknowledgements

The author would like to take the opportunity to extend special thanks to respondents of Durgapasha Union for their kind co-operation in the field during data collection. We are also grateful to Md. Faisal and Asheif Mahmud for their cooperation in completing the paper. We sincerely appreciate reviewers for constructive comments.

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