

Vulnerability and adaptation in flood affected areas in Sirajganj district of Bangladesh

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Abstract: This study was undertaken to investigate the vulnerability of climate change and to gather information on the existing and recommended adaptation measures for the flood affected areas of Kazipur Union of Kazipur Upazila of Sirajganj district. Data were collected from three selected villages by random sampling after selecting the study topic and area. The respondents were classified according to their age, family status, education level, occupation, pattern of migration, sources of water etc. Most of the families of the study area were medium sized which was about 50%. Illiteracy is the major problem of the study area. About 51% people were illiterate. 40% people were depended on farming as their major earning source. Data collected to assess the impact of flood on the study area under three broad categories namely before, during and after flood showed that due to flood different types of diseases were broken out. They got their health care facilities mostly from govt. hospital which was about 36.7% before and during flood. After flood different types of NGOs also gave them health care facilities which were about 16.6%. After flood 11.67% small income groups were increased and 13.33% middle income groups were decreased to large and small income groups. After flood 63.33% people were depended on wheat. Wheat consumption was increased due to the lack of rice. Due to flood income of the people from agriculture were decreased to 41.67% from 66.67% and the beggar and rickshaw driver were increased. After flood 3.33% cattle were reduced and 21.67% poultry were reduced. Livestock and poultry were affected with various types of diseases during and after flood and most of the livestock and poultry treatment were taken from different NGOs. Many people did not get their livestock and poultry treatment. From the study we found that the contributions of NGOs were more to adapt with the adverse situation. The findings also indicated that the pre-flood preparation activities and adaptation tools were not enough for flood disaster risk reduction for the affected people of the study area.

Key words: Vulnerability, adaptation, flood, sirajganj.

Introduction

Bangladesh currently ranks as one of the world's foremost disaster prone country. The situation is aggravated, all the more by its being the most densely populated country in the world (Choudhury, 2007). Every year, natural calamities upset people's lives in some parts of the country. The extreme natural events are termed disasters when they adversely affect the whole environment, including human beings, their shelters, or the resources essential for their livelihood. The geographical setting of Bangladesh makes the country vulnerable to natural disasters (MoEF, 2005). The mountains and hills bordering almost three-fourths of the country, along with the funnel shaped Bay of Bengal in the south, have made the country a meeting place of life-giving monsoon rains, but also make it subjected to the catastrophic ravages of natural disasters. Its physiographic setting and river morphology also contribute to recurring disasters. The major disasters that are concerned here are the occurrences of flood, cyclone and storm surge, flash flood, drought, tornado, riverbank erosion, and landslide (Hossain, 2008). Among these disasters, flood is considered as the major and most devastating disaster to the human habitation of this country.

Sirajganj district is one of the most vulnerable to flood in the country. The past record shows that every flood that passed through Bangladesh must affect Sirajganj district. Among the Upazilas of Sirajganj district, Kazipur Upazila is the most vulnerable to flood hazard. Every year, the country experiences huge amount of losses (both monetary and lives of people and cattle) caused by several disasters, because of lack of proper preparedness and disaster management measures (Rashid and pramanik, 2004). However, Kazipur union being a coast of Jamuna river, flood and riverbank erosion is the common natural disaster of the study area. It is evident from many studies that like many other places of the country, at Kazipur Upazila of Sirajganj district, flood affected peoples of flood

mitigation are not quite successful due to several reasons. The ultimate result is the huge damage of resources and enormous sufferings of the people by this natural calamity. The impact of flood and adaptation measures taken before, during and after flood were attempted to find out. Presently, the assessments of losing land and properties, perception about the survival strategies and the range, choice and number of mobility of the affected people are some of main focus of this study. In this study the adaptation measures for agriculture, livestock, fisheries and the present trend of coping strategies adopted by the people to adapt with the adverse situation of the study area will be tried to find out.

Materials and Methods

The study was conducted during 3 September 2014 to 5 October 2014 at Polashpur, Masuakandi, and Shingrabari villages under the Kazipur union in Kazipur upazila of Sirajganj district in Bangladesh (Fig. 1-2). Micro-data from a farm-level survey conducted by the first author was the main source of data. A sample of 60 flood affected peoples was drawn using proportionate random sampling technique. Personal interviews were conducted using a pre tested structured interview schedule. SPSS and MS-Excel computer soft wares were used to aid the data analysis and presentation.

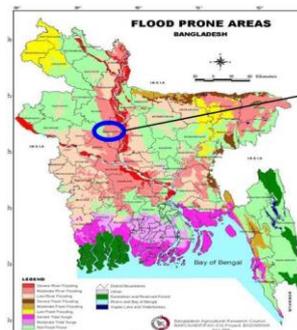


Fig. 1. Map of Flood prone areas of Bangladesh



Fig. 2. Administrative map of Kazipur upazila

Results

The findings of the survey have been presented in the following sections: The selected characteristics of the respondents, the changes in the production of crop, livestock, fisheries, income, expenditure, changes in occupation profile, migration, sources of water, types of latrine use, major diseases prevalence in flood affected

people. Changes in food habit due to flood, changes in livestock and poultry due to flood, diseases prevalence in flood affected livestock and poultry, treatment systems of livestock and poultry, Agricultural adaptation have also been represented. Table 1 shows the socio-demographic characteristics of the respondents.

Table1. Socio demographic characteristics profile

Variables	Way of Measurement	Categories	Respondents Number	Respondents %
Age	Years	Young (<30)	8	13.3
		Middle (30-40)	46	76.7
		Old (>40)	6	10.0
Education	Year of schooling	Illiterate (0)	30	51
		Illiterate but can sign only(1)	22	38
		Primary (1-5)	6	8
		Secondary (6-10)	2	3
Family Size	Number of people	Small (<2)	25	43.33
		Medium (3-5)	30	50
		Large (>5 or above)	5	6.6
Family Status	Scoring Scale	Combined family	6	8
		Single family.	54	92
Occupation	Scoring Scale	Farmer	24	40
		Fishermen	19	32
		Beggar	3	5.3
		Rickshaw driver	4	6.3
		Services	1	1.7
		Others	9	14.7
		Assessment of local people and migrant people	Scoring Scale	Local people
		Migrant people	54	90

Assessment of migration due to river bank erosion and flood: Many people migrated to the neighbour village or neighbour town or some other places due to riverbank erosion and flood. The percentage of migration due to river bank erosion was about 61.67 and due to flood were about 38.33 (Fig. 3).

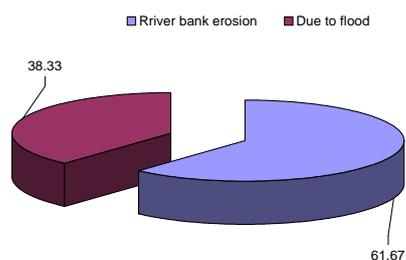


Fig. 3. Percent of migration due to river bank erosion and flood

Assessment of commonly occurring climate change hazards: Climate change hazards were riverbank erosion, flood, draught and cyclone. The percentage of riverbank erosion, flood, draught and cyclone were about 56, 32, 7 and 5 respectively.

Assessments of sources of water: Most of the people of the study area used tube well water and some people used river water as the source of water. The percentage of tube well users was about 58.33 and the percentage of river water users was about 41.67. But during flood most of the people used flood water for their household purposes which caused several types of diseases such as diarrhoea, dysentery, skin diseases etc.

Assessment of types of latrine uses: Different types of latrine were used by the people of the selected area, these were sanitary, kancha, hanging and open places but the percentage varied before during and after flood. The percentages of sanitary latrine users before, during and after flood were about 11.67, 8.33 and 10 respectively. The percentages of kancha latrine users before, during and

after flood were about 28.33, 20 and 21.67 respectively. The percentages of hanging latrine users before, during and after flood were about 15, 25, and 20 respectively. Open place users for excretion purposes before, during and after flood were about 45, 46.67 and 48.33% respectively (Fig. 4). Due to excretion on the open places during and after flood different types of diseases were broken out such as diarrhoea, cholera, dysentery etc.

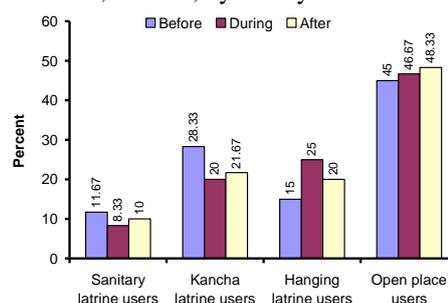


Fig. 4. Types of latrine uses

Assessment of human diseases during and after flood: During and after flood most of the people were suffered from diarrhoea which were about 21.67% and 30% respectively. People of the study area were also suffered from cholera, during flood 16.67% and after flood 18.33%. Dysentery during flood 20% and after flood 21.67%. Some other diseases during and after flood were typhoid, zandis, malaria and influenza (Table 2).

Table 2. Assessment of human diseases during and after flood

Name of the diseases	during flood		after flood	
	Frequency	Percent	Frequency	Percent
Diarrhoea	13	21.67	18	30
Cholera	10	16.67	11	18.33
Dysentery	12	20.0	13	21.67
Typhoid	5	8.33	3	5
Zandis	7	11.67	8	13.33
Influenza	5	8.33	4	6.67
Malaria	8	13.33	3	5

Assessment of health care facilities before flood: Before flood the people of the study area got their healthcare facilities from Government hospital, Quack and Kabiraj. Most of the people took their health care facilities from Government hospital which was about 36.7% but the influence of Kabiraj was not bad, which was about 35% and the healthcare facilities taken from Quack was about 28.3%.

Assessment of health care facilities during flood: During flood they got their healthcare facilities from Government hospital which was about 36.7%, from Quack was about 30% and from Kabiraj was about 33.3% (Fig. 5).

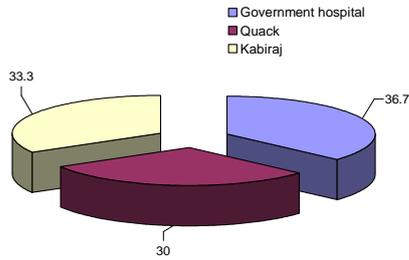


Fig. 5. Health care facilities taken from different sources during flood

Assessment of health care facilities after flood: After flood they got their health care facilities from different sources such as the Govt. hospital which was about 36.7%, from Quack was about 30% and from Kabiraj was about 16.65%. After flood different NGOs gave them health care facilities which was about 16.65 percent (Fig. 6).

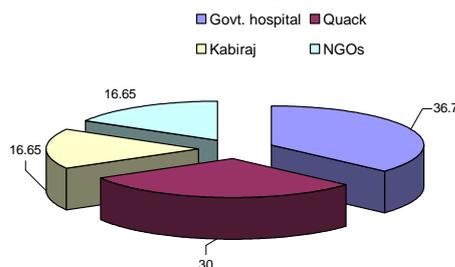


Fig. 6. Health care facilities taken from different sources after flood

Assessment of changes in income: The income of the people are classified into three classes which were small income (<15000), medium income (15000-20000) and large income (>20000). But due to flood the income of the people were decreased. From the above figure we can see that the percentage of small income group was about 58.33% before flood and after flood small income groups were increased and became 70%. But the percentage of medium income groups decreased after flood which was about 33.33% before flood and 20% after flood. On the other hand, the percentage of large income groups was increased after flood, which was about 8.34% before flood and 10% after flood. After all flood had a great impact on the changes of income.

Assessment of changes in source of income: The sources of income changed due to flood. Before flood agriculture was the source of income for the people of about 66.67% which was decreased after flood and became 41.67%. Before flood beggar was about 11.67% which increased after flood and became 28.33%. Before flood rickshaw driver was about 15% which was increased after flood and

became 21.67%. Service was the sources of income for the people of about 1.66% before and after flood respectively and before flood 5% people's income was from other sources which was increased after flood and became 6.67%.

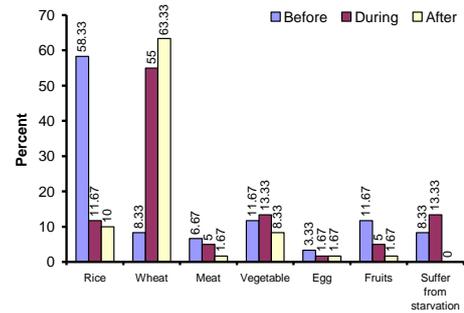


Fig. 7. Changes in food habit due to flood

Assessment of changes in food habit due to flood: The food habits of the people were greatly changed due to flood. Before flood the consumption of rice was about 58.33% which was decreased during and after flood and became 11.67% and 10% respectively. On the other hand the percentage of wheat consumption was about 8.33% before flood. During and after flood it was increased to 55% and 63.33% respectively. Consumption of wheat mainly increased after flood when the shortage of rice occurred. Before flood percentages of meat, vegetables, eggs and fruits consumption were 6.67, 11.67 and 3.33 and 11.67 respectively which were decreased after flood. Before flood no people had to starve but after flood the percentage of starvation was increased to 13.33% from 8.33% during flood (Fig. 7).

Table 3. Assessment of livestock diseases and poultry diseases

Name of the diseases	during flood		after flood	
	Frequency	Percent	Frequency	Percent
Ranikhet	4	6.67	8	13.33
Cholera	7	11.66	10	16.67
Pox	13	21.67	15	25
Others	1	1.67	12	20
Without disease	35	58.33	15	25

Table 4. Assessment of changes in livestock and poultry

	Cases					
	Included		Excluded		Total	
	Number	Percent	Number	Percent	Number	Percent
Dairy before	60	100	0	0	60	100
Dairy after	58	96.67	2	3.33	60	100
Poultry before	60	100	0	0	60	100
Poultry after	47	73.33	13	21.67	60	100

Assessment of livestock disease and poultry diseases: During and after flood the livestock and poultry were affected with various types of diseases such as Ranikhet, Cholera, Pox etc. which is shown in the (Table 3). The numbers of dairy cattle and poultry stocks were also charged due to floods (Table 4). Due to flood 3.33% dairy were reduced and 21.67% poultry were reduced.

Assessment of livestock and poultry health care facilities: Most of the people got their livestock treatment from NGOs during and after flood. The livestock healthcare facilities taken from NGOs were 65% during flood and 63.3% after flood. They also got livestock health care facilities from government hospital which was about 28.3% during and after flood. Many people did not get livestock and poultry healthcare facilities and the

percentage was 6.7 and 8.3 during and after flood respectively (Fig. 8-9).

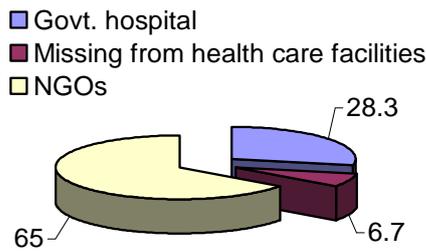


Fig. 8. Livestock and poultry health care facilities taken from different sources during flood

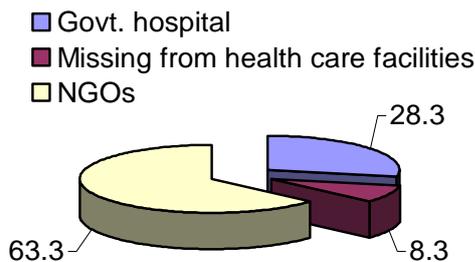


Fig. 9. Livestock and poultry health care facilities taken from different sources after flood

Discussion

In the study area flood played a vital role in changing the lifestyle of the people. Most of the people of the study area were illiterate and most of them were farmer. Many people migrated to some other places due to flood and riverbank erosion. Various types of natural disasters were very common in the study area, river bank erosion and flood are the main disaster for them. Flood changed their source of drinking water which caused various diseases. Diarrhoea was the main disease for them. After flood most of the people used open places for their excretion purposes. It was the reason for the outbreak of diseases. They got their healthcare facilities mostly from the govt. hospital. Flood had great impact in changing the income and occupation of the people. Small income groups were increased and medium income groups were reduced after flood. Flood greatly affected the middle income groups. Most of the people depended on agriculture before flood but after

flood beggar and rickshaw driver were increased. After flood wheat consumption was increased due to the shortage of rice. Flood worstly affected the production of crops. Many people had to starve during and after flood due to the shortage of food.

The production of livestock and poultry also decreased due to flood. People got their livestock and poultry treatment mostly from the NGOs during and after flood. Flood seriously damaged their life and property. After flood it was really a great challenge for the victims to meet their primary needs. Most of them had no shelter, food, cloths and pure drinking water. The contributions of NGOs were more to meet their primary needs than the GOB and other organizations. The NGOs supply them foods, clothes, housing materials, pure drinking water and health care facilities before, during and after flood.

The level of living standard of the respondents was decreased due to decrease of production and reduced the average income after flood. Flood changed the profession of the affected people. The causes of migration of the people were flood and riverbank erosion. Due to the occurrence of different disaster most of the people of the study area were poor. Farming and fishing were their main occupation. To meet their primary needs they were depended on NGOs, GO and other organizations. But they got various facilities mostly from the NGOs. After all floods has great impact on crop, livestock and people's adaptation to it in some villages of Kazipur union under the Kazipur Upazila in Sirajgonj district of Bangladesh.

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