EFFECT OF FLOODING ON HUMAN LIFE AND ENVIRONMENT IN SIRAJGANJ DISTRICT OF BANGLADESH

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ABSTRACT

The study was carried out at five upazilas under Sirajganj District. The purposes of this study were to determine and describe the selected characteristics of the respondents, to determine the effect of flooding on human life and environment and to explore the relationship between the selected characteristics of the respondents and the effect of flooding. Data were collected from 300 respondents (population 1200) using personal interview during July to August 2013.Frequency and percentage were used as descriptive statistical parameters and Pearson's Product Moment Correlation Coefficient (r) was used for measuring the relationship between the effect of flooding and selected characteristics of the respondents. Effect of flooding was measured on three dimensions namely loss during flooding, environmental degradation and socio-economic loss. The highest proportion of the respondents (32.7%) losses mainly crops whereas 28.7% loss land, 20.0%loss domestic animal and 18.6% losses house. The highest proportion of the respondents (45%) had high degradation of environment whereas 33% had medium degradation and 22% had low degradation of environment due to flood. 44% of the respondents faced high socio-economic losses whereas 33%faced medium and 23% of the respondents had low socio-economic losses due to flood. All the selected characteristics of the respondents i.e. age, education, occupation, monthly income, family members, causes of flooding, sources of drinking water, problem faced and diseases had positive significant relationship with the effect of flooding.

Keywords: Effect, environment, flood, human life

INTRODUCTION

Bangladesh is most vulnerable to several natural disasters and every year natural calamities upset people's lives in some part of the country. The major disasters concerned here are the occurrences of flood, cyclone, and storm surge, flash flood, drought, tornado, riverbank erosion and land slide (UNEP 2011).

The floods of 1987, 1988, 1998, 2004, 2007 and cyclone of 1991, 2007 and 2009 were treated as a consequence of global warming, sea level rise and its associated other problems by the scientists. In this connection, river bank erosion, drought, flash floods, threats from landslides as a result of excessive rainfall could be attributed to recent climatic anomalies. IPCC states in their Third (2001) and Fourth Assessment (2007) reports that the global average surface temperature has already increased by 0.6°C (±0.2°C) during last 140 years and 0.74°C (±0.18°C) during the last 100 years respectively and likely to increase from 1.4° to 5.8°C by 2100. In Bangladesh, the projections show that by 2030, 0.7°C temperature rise in monsoon season and a 1.3°C rise in the winter season might take place.

Flood is the common phenomenon in Bangladesh. About 30 to 35 percent of the total land surface of the country is flooded every year during wet monsoon (Milliman *et al.* 1989). These normal floods are considered as a blessing for Bangladesh providing vital moisture and fertility to the soil through the alluvial silt deposition. More than two crore people in 41 districts faced problems related to food and drinking water due to flooding as most rivers surging high above the danger mark in the central, northern and northeastern region of the country.

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Floods can also occur in rivers, when the strength of the river is so low it flows out of the river channel, particularly at bends or meanders and causes damage to homes and businesses along such rivers (Thompson 1964).Bangladesh is known as the 'land of rivers' and major rivers that flow through Bangladesh is Jamuna, Padma, Meghna and with a complex network of 230 rivers including 57 international trans-boundary (cross boundary) rivers.

The impact of flood hazard on agricultural food production is global concerns, and they are very important for Bangladesh. Agriculture is the single most and the largest sector of Bangladesh's economy, accounting for about 16.33% GDP and about 63.0% of the labour force (BBS 2014). Agriculture in Bangladesh is already under pressure both from huge and increasing demands for food, and from problems of agriculture land and human life style. The prospect of flood hazard makes the issues particularly urgent (Huq 2003).

Floods make an enormous impact on the environment and society. Floods destroy drainage systems in cities, causing raw sewage to spill out into bodies of water. This can lead to catastrophic effects on the environment as many toxic materials such as paint, pesticide and gasoline can be released into the rivers, lakes, bays, and ocean, killing maritime life. However, floods do make a slight positive impact on the environment. Floods spread sediment containing beneficial nutrients to topsoil (Wikipedia 2009).

Sirajganj district is an area of perennial floods and its image is that of an area which is always flooded. Every part of the district is not equally vulnerable to flood. Some upazilas are more vulnerable than other due to their location. Chauhali, Kazipur, Sirajganj Sadar, Belkuchi, Ullahpara and Shahjadpur are most flood affected upazilas. Sirajganj is more or less flooded almost every year, however, severe floods of 1949, 1956, 1961, 1962, 1966, 1968, 1974, 1979, 1987, 1988, 1996, 1998, 2002, 2004, 2007 and 2008 are worth mentioning (NDP 2007).

Extensive floods greatly affect the marginal population, who lose whatever assets they have and suffer from lack of work and wages. People who live in perennial flood zones in the bank of the Jamuna river have low indicators in all sectors of health, nutrition and education. However, floods cause serious damage to crops, property, fisheries and livestock and other resources. It is an important issue to assess the effect of flood in the study. Therefore, the study was conducted with the following objectives- i) to determine and describe the selected characteristics of the respondents. The

characteristics include age, education, occupation, monthly income, family members, causes of flood, sources of drinking water, problem face and diseases, ii) to determine the effect of flooding on human life and environment and iii) to explore the relationship between the selected characteristics of the respondents and the effect of flooding.

MATERIALS AND METHODS

The study was carried out at five purposively selected upazilas (Sirajganj sadar, Belkuchi, Chauhali, Kazipur and Tarash) under Sirajganj District. A list of 1200 farm families who were vulnerable to flood was collected from concerned upazila administration office which constitutes the population of the study. Out of 1200 farm families twenty five percent (25%), i.e., 300 respondents were selected as a sample of the study by simple random sampling method. Data were collected by using pretested interview schedule through face to face interview during July to August 2013.The purpose of the study was explained to the respondents and requested them for help and co-operation for collecting necessary data. The selected 9 characteristics of the respondents namely age, education, occupation, monthly income, family members, causes of flood, sources of drinking water, problem face and diseases were considered as independent variables. Effect of flooding was considered as dependent variable of the study.

Among 9 independent variables age, education, monthly income and family members were measured through appropriate scoring whereas occupation, causes of flood, sources of drinking water, problem face and diseases were measured by per citations scoring. Effect of flooding was selected as the dependent variable of the study. Effect of flooding was measured in three dimensions namely a) loss during flooding, b) environmental degradation and c) socio-economic loss. Loss during flooding was measured by using per citations scoring whereas environmental degradation and socio-economic loss were measured by using 3-point rating scale such as 1 for 'low', 2 for 'medium' and 3 for 'high' environmental degradation and socio-economic loss respectively. Thus, the effect of flooding for each respondent ranged from 3 to 10, where 3 indicates low effect and 10 indicates high effect. This scoring was only used for inferential analysis. Pearson's product moment coefficients of correlation were used to explore the relationships between selected characteristics of the respondent and the effect of flooding.

RESULTS AND DISCUSSION

The findings of the study and its interpretation are presented below according to the objectives of the study.

Selected characteristics of the respondents: The selected characteristics of the respondents are age, education, occupation, monthly income, family members, causes of flood, sources of drinking water, problem faced and diseases. The categorization as well as number of respondents and their percentage is given in Table 1.

Table 1 revealed that the highest proportion of the respondents (44.3%) were old aged whereas 32.7%were middle aged and 23.0%were young aged. The highest proportions of respondents (41.0%) were illiterate followed by 28.0% passed primary level, 20.3% passed secondary level and 10.7% passed upper secondary level. In respect to occupation 31.3% respondents are farmer whereas 24.3%were labor, 20.7% were fisherman,12.7% were businessman and11.0% were Govt./private sector. The majority of the respondents (44.7%) had low income, while 33.0% belonged to medium income and only 22.3% of the respondents belonged to high income.

The research also revealed that majority of the respondents (46.0%) had large family, while 31.3% had medium family and22.7% had small family members. Majority of the respondents (39.7%) mentioned climate change as the most important causes of flooding whereas 36.3%said about lack of management and 24.0%said about Farakka barrage. Most of the respondents (45.3%) use tube wellas the sources of drinking water, 27.7%use river water and 27.0%use supply water for the drinking purposes**.** Most of the respondents (28.7%) faced problem on lack of communication whereas 25.7% faced lack of drinking water,24.7% faced lack of food and 21.0% faced lack of health services. Majority of the respondents (34.0%) are suffering from diarrhoea, 25.0% from cholera, 22.0% from typhoid and 19.0% are suffering from dysentery in the study area.

Table 2 showed that the highest proportion of the respondents(32.7%) mentioned that flood causes losses mainly crops whereas 28.7% mentioned land loss, 20.0%mentionedabout domestic animal and 18.6%mentioned house losses. The highest proportion of the respondents (45.0%) mentioned flood causes high degradation to environment whereas33.0% indicate medium degradation and 22.0%mentionedlow degradation of environment due to flood. Based on socio- economic losses, data revealed that 23.0%of the respondents had low socio-economic loss, 33.0%had medium and 44.0%faced high socio-economic losses due to flood. So, it can be concluded that flood causes a great loss to human life and environment

Table 1. Salient features of the respondents

Variables	Category	No. of respondent	%
Age	Young aged (up to 20 years)	69	23.0
	Middle aged (>20 to 45 years)	98	32.7
	Old aged (above 45 years)	133	44.3
Education	Illiterate (0)	123	41.0
	Primary level (1-5)	84	28.0
	Secondary level (6-10)	61	20.3
	Upper secondary level (above 10)	32	10.7
Occupation	Labor	73	24.3
	Govt./private sector	33	11.0
	Businessman	38	12.7
	Farmer	94	31.3
	Fisherman	62	20.7
Monthly income	Low income (<15000)	134	44.7
	Medium income (15000-20000)	99	33.0
	High income (>20000)	67	22.3
Family members	Small family (up to 2)	68	22.7
	Medium family (3-5)	94	31.3
	Large family (>5)	138	46.0
Causes of flood	Climate change	119	39.7
	Farakka barrage	72	24.0
	Lack of management	109	36.3
Sources of drinking water	Tube well water	136	45.3
	River water	83	27.7
	Supply water	81	27.0
Problem faced	Lack of communication	86	28.7
	Lack of food	74	24.7
	Lack of drinking water	77	25.6
	Lack of health services	63	21.0
Diseases	Cholera	75	25.0
	Typhoid	66	22.0
	Dysentery	57	19.0
	Diarrhoea	102	34.0

N= Number of respondents, N=300

Effect of flooding

Effect of flooding was measured through three dimensions namely losses during flooding, environmental degradation and socio-economic loss. The data are presented in Table 2 and their interpretation is given below.

Table 2. Effect of flooding on environmental degradation and socio-economics

Dimensions	Category	No. of respondent	%
Losses during flooding	Crop	98	32.7
	Land	86	28.7
	Domestic animal	60	20.0
	House	56	18.6
Environmental degradation	Low degradation (up to 12)	66	22.0
	Medium degradation (13-20)	99	33.0
	High degradation (above 20)	135	45.0
Socio-economic losses	Low loss (up to 12)	69	23.0
	Medium loss (13-20)	99	33.0
	High loss (above 20)	132	44.0

Relationship between the selected characteristics of the respondents and the effect of flooding

This section deals with the relationship of the nine selected characteristics of the respondents with the effect of flooding. The selected characteristics are age, education, occupation, monthly income, family members, causes of flooding, sources of drinking water, problem faced and diseases. Co-efficient correlation 'r' was computed to explore the relationship between selected characteristics of the respondents with the effect of flooding as shown in Table 3.

Table 3. Relationship between characteristics of the respondents and effect of flooding

Dependent variable	Independent variables	Computed value of 'r' at 298 degrees of freedom
Effect of Flooding	Age	0.776**
	Education	0.824**
	Occupation	0.804**
	Monthly income	0.842**
	Family members	0.798**
	Causes of flooding	0.801**
	Sources of drinking water	0.501**
	Problem faced	0.882**
	Diseases	0.862**

**** Significant at 1% level of probability.

Data from Table 3 revealed that all the characteristics namely age, education, occupation, monthly income, family members, causes of flooding, sources of drinking water, problem faced and diseases had positive significant relationship with the effect of flooding. So, it may be said that these characteristics had influence on the effect of flooding.

CONCLUSIONS

The highest proportion of the respondent (61.4%) mentioned that losses during flooding occur in crop and land. So, it may be concluded that standing crop with land affect severely during unexpected flooding. Nearly half (45.0%) of the respondents perceived that high environmental degradation occurs due to flooding. From this it may be concluded that flood had considerable amount of effect on environmental degradation. Majority of the respondents (44.0%) mentioned that they faced high socio-economic losses during flooding. The findings leads to conclude that like environmental degradation also had effect on socio-economic loss of the respondents of the study area. Among the selected characteristics of the respondents nine characteristics had positive significant relationship with effect of flooding. So, it may be concluded that certain attributes of the respondents had important role on effect of flooding

RECOMMENDATIONS

Flood risk area should be identified as well as the preventive measures of flooding should be taken by the concerned authorities. As the education status of the respondents is not so good. So, the affected peoples of the study area may be trained up about

the coping strategies of flooding. The effect of flooding was measured only in three dimensions. Further research work may be undertaken by including other relevant dimension regarding flooding. The nine characteristics, namely age, education, occupation, monthly income, family members, causes of flooding, sources of drinking water, problem face and diseases were positively related with effect of flooding. Therefore, it is recommended that these characteristics need to be emphasized in planning and executing in reducing the harmful effect of flooding.

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