

## LIVELIHOOD ASSETS OF SIDR AFFECTED FARMERS OF BAGERHAT DISTRICT IN BANGLADESH

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### Abstract

People of Bangladesh are vulnerable to disasters and have suffered repeatedly due to floods and storm surges, On 15 November 2007, a cyclone sidr struck coastal and central areas of Bangladesh and caused severe suffering to the affected people. The study was conducted with sidr affected farmers of Mollarhat Upazila of Bagerhat district to determine the extent of the problems they faced regarding lack of dwelling house, unhygienic drinking water, outbreak of diarrhoea, cholera, insufficient relief and increased salinity intension etc by the farmers to mitigate the hazardous effects of sidr on their farming systems. One hundred farmers were selected randomly for data collection through pretested interview schedule during March to April 2009. Extent of livelihood assets of the sidr affected farmers was the dependent variable of the study and their selected eight characteristics constituted the independent variables. Most of the farmers (60%) had medium livelihood assets while 20 and 14% of them had weak and strong capacity, respectively. They had the highest livelihood assets regarding natural capital and lowest capacity regarding financial capital. Effective support and long term planning from the GO and NGOs are desirable to overcome the vulnerable situation of the sidr affected farmers.

**Keywords:** Disasters, capital, households, dependent and independent variables.

### Introduction

Cyclone Sidr was a tropical cyclone that resulted in one of the worst natural disasters in Bangladesh. Storm surges reaching up to a height of 3 metres (9.8 ft) were reported in the coastal areas of north Chennai in southern state of Tamil Nadu in India, triggering panic among the fishing community. The damage in Bangladesh was extensive, including tin shacks flattened, houses and schools blown away and enormous tree damaged. Some local officials have described the damage as being even worse than that from the 1991 cyclone. The entire cities of Patuakhali, Barguna and Jhalokati district were hit hard by the storm surge of over 5 meters (16 ft). About a quarter of the world heritage site Sunderbans were damaged. Researchers said mangrove forest Sunderban will take at least 40 years to recover itself from this catastrophe. Much of the capital city of Dhaka was also severely affected, as electricity and water service were cut and significant damage was reported there due to winds and flooding. At least 3,447 deaths have been reported. The hardest-hit area was Barguna, where 423 people were reported to have been killed, according to local officials. Patuakhali was also hard-hit, with 385 deaths reported. Most of the deaths confirmed thus far were due to the winds, although 13 of them have been as a result of capsized boats in the Faridpur district of Bangladesh. The head of the Red Crescent in Bangladesh expected the death toll to reach as high as 15,000. Over 3,000 other fishermen were reported missing on over 500 fishing boats. The maximum estimated death toll from Sidr in the densely populated region is over 15,000. Cyclone Sidr slammed the highly vulnerable low lying densely populated coastal areas of Bangladesh with heavy rain, winds of up to 120 miles hr<sup>-1</sup>, and a storm surge. Sidr may be the strongest cyclone to hit the country since a cyclone killed over 143,000 Bangladeshis in 1991. Tidal waves from the Meghna entered Charmadraj breaking the protection embankment (Uddin, 2008). Although, the death from Sidr number in the thousands but damage to homes, crops and livelihoods could be extensive and were reportedly worst. Effective early warning, cyclone shelters and disaster relief measure implementations helped reduce the death toll. Under a Cyclone Preparedness Program, volunteers evacuated at least 600,000 Bangladeshis in the path of the storm. Many are housed in 1,800 multipurpose disaster shelters built along the coast. Relief organizations distributed seven-day emergency

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disaster kits of food, blankets and clothing for evacuated families. Thousands of people are still living under the open sky with no food, drinking water or medicine. Countless trawlers and fishing boats remain missing with hope diminishing for any survivors. These physical assets were used for cultivation. Health status at that locality was in poor condition. Their earning sources were limited so they were in danger. They cannot communicate among their neighbors, friends and relatives due to destruction of communication facilities (IFRC, 2007). Considering the above fact in view, it was necessary to undertake a research study entitled "Livelihood assets of sidr affected farmers of Bagerhat district in Bangladesh". Main focus of the study was to determine the effect of sidr on varied capital livelihood of rural landless. In view of the considerations stated above the following specific objectives were formulated.

- a) To find out the livelihood assets of sidr affected farmers in Bangladesh.
- b) To explore the association between the selected characteristics of the farmers and their livelihood assets. The selected characteristics were: Age, Education, Family size, Family dependency, Farm size, Annual family income, Extension media contact, Livestock and poultry possession.
- c) To determine the problems faced by farmers to mitigate the hazardous effects of sidr on their farming systems.

Besides, research information on sidr and its related issues are insufficient. The present study may give pertinent information for making policy decision regarding livelihood assets of the sidr affected farmers of Bangladesh.



**Fig.1. Cyclone sidr**

## **Materials and Methods**

Methodological issues followed in conducting the study have been presented in this Chapter. Those issues are the foundation on which the research process rests upon. The methods and operational procedures followed in conducting the study e.g. selection of study area, sampling procedure, instrumentation, operationalization of variables, collection of data, measurement of the variables and statistical treatments. This Chapter also spells out the methods used, all are presented sequentially.

### ***Locale of the Study***

The study area was selected in Mollahat upazila of Bagerhat district which were severely affected ones. Majority of the population of that area were functionally affected by sidr and led their livelihoods with misery and hardship. Their livelihoods were vulnerable to stresses and shocks and they drive to find the way to escape out. Mollahat Upazila with an area of 187.44 sq km has a population of 116729. It consists of 8 union parishads and 102 villages.

### ***Population and Sample***

Sidr affected people of the selected villages were the population of the study. Selection of sample was done with proportionate random sampling method, thus, 100 households were selected randomly from 996 households of the selected villages. From each of the selected households, interview was conducted with one family member. The distribution of sampled households is shown in Table 1. Thus, sample size stood 100 which was 10 percent of the total households of the selected villages.

### ***Instrument of Data Collection***

In order to collect relevant data for the study, a structured interview schedule was carefully prepared keeping the objectives in mind. The questions and statements contained in the schedule were simple, direct and easily understandable to the respondents. The schedule contained both open and closed form of questions.

### ***Measuring Procedures***

This section contains procedures for measurement of independent variable (age, education, family size, family dependency ratio, farm size, family income, extension media contact, livestock and poultry possession) and dependent variable livelihood assets of sidr affected farmers.

### ***Measurement of Problems Faced by the Farmers***

Problems faced by the farmers to mitigate the hazardous effects of sidr on their farming system were identified through open type questions. Initially, various issues of sidr were critically discussed with the respondents. Then they were asked to mention the problems they actually faced to mitigate the hazardous effect of sidr on their farming system. The identified problems were noted down in the interview schedule.

### ***Statement of Hypothesis***

The characteristic profile of sidr affected farmers is related to their livelihood assets. The research hypothesis was converted into null form for the purpose of statistical testing. The following major null hypothesis was developed:  $H_0$ : There is no relationship between selected characteristics of the sidr affected farmers and their livelihood assets.

### ***Data Collection Procedure***

The researcher himself collected data through face to face interview from sample respondents using the interview schedule during March to April 2009. Before starting the collection of data, the researcher approached the Sub Assistant Agriculture Officer (SAAO) of the block of the study area. The researcher also discussed the objectives of the present study with BRAC and Grameen Bank personnel working in the study area and also sought help from local leaders.

### ***Data Processing and Analysis***

The collected data were compiled, coded and tabulated according to the objectives of the study. In this process, all the responses in the interview schedule were given numerical code and were transferred to a master sheet to facilitate tabulation. The respondent were classified into several categories for clear and easy description of different variables.

## **Results and Discussion**

The findings of this study and their logical interpretations have been systematically presented in different sections of this Chapter according to the objectives of the study.

***Selected Characteristics of Sidr Affected Farmers:*** In the study there were eight selected characteristics of sidr affected farmers such as age, education, family size, family dependency ratio, farm size, family income, extension media contact and livestock and poultry possession. The composite findings of the selected characteristics of the sidr affected farmers in the study area are presented in Table 4 and have been discussed in subsequent sections.

***Age:*** Age of the respondent was found to vary from 22 to 75 years with a mean of 49.67 years and standard deviation of 11.17. Based on their age distribution the respondents were classified into three categories as young, middle aged and old as shown in Table 2; Data contained in Table 2 indicated that the majority (58%) of the people fell in the old category, while 4 and 38% belonged to young and middle aged categories, respectively. Data were collected from one family members generally head of the selected households. In rural Bangladesh, still joint family is existing.

***Education:*** It is evident from the Table that 7 percent of the respondent were totally illiterate. Thirty seven percent of them had primary level academic qualification and 37% had secondary level education. Nineteen percent of respondent had above secondary level academic qualifications. Majority of the farmers in the locality had primary and secondary level of education. Few farmers (7%) were illiterate. This is an encouraging literacy rate comparing the national literacy rate of 51.6 percent (BBS, 2006). Nineteen % farmers in the study area were above secondary education in the research, because highly education people migrated from rural area to urban area.

**Table 1. Distribution of the sampled households**

Union	Village	Population	Persons included in the sample
Atjuri	Choratjuri	529	53
	Kahalipur	467	47
	Total	996	100

**Table 2: Salient features of the Sidr affected farmers selected characteristics**

Selected characteristics	Measuring unit	Range		Sidr affected farmers (n=100)*		Mean	SD
		Possible Score	Observed Score	Categories	%		
Age	Years	-	22-75	Young ( $\leq 30$ )	4	49.67	11.17
				Middle aged (31-45)	38		
				Old ( $>45$ )	58		
Education	Year of schooling	-	0.15	Illiterate (0)	7	7.18	4.00
				Primary (1-5)	37		
				Secondary (6-10)	37		
				Above secondary ( $>10$ )	19		
Family size	Number	-	2-11	Small ( $\leq 4$ )	33	5.44	1.69
				Medium (5-6)	49		
				Large ( $>6$ )	18		
Family dependency ratio	Ratio	-	0.50-9.00	Low ( $\leq 2$ )	16	3.91	1.60
				Medium (2-4)	48		
				High ( $>4$ )	36		
Farm size	Hectare	-	0.00-11.17	Landless ( $\leq 0.02$ )	1	1.37	1.59
				Marginal (0.021-1.20)	3		
				Small (0.21-1.0)	45		
				Medium (1.1-3.0)	42		
Annual family income	'000' tk.	-	0.00-460	Large $>3$	9	85.07	94.76
				Low ( $<50$ )	44		
				Medium (50-100)	28		
Extension media contact	Score	0-48	5-24	High $>100$	28	122.96	3.76
				Low ( $\leq 16$ )	82		
				Medium (17-32)	18		
Livestock and poultry possession	Score	-	0-734	High ( $>32$ )	0	333.17	201.20
				Poor ( $\leq 132$ )	17		
				Fair (133-534)	66		
				Good ( $>534$ )	17		

\*Number and % of the respondent are the same

**Family size:** Family size of the respondent ranged from 2 to 11 with a mean of 5.44 and standard deviation of 1.69. On the basis of family size scores the respondent were classified into three categories, namely small, medium and large as shown in Table 2. Data presented in the Table 2 showed that the highest proportion (49%) of the respondents fell under small family compared to 33 and 18% under small and large family respectively. It was found that medium size family were more less than half of the total respondent in the study area. Small family sizes were above 30% because they people in the locality used family planning and other birth control measures. Fragmentation of large family size is one of the main causes of small family size. The large family size is lower than medium and small family size in the study area, because people in the rural area were mostly skeptical and unconscious, their thinking are mostly indigenous and have not enough knowledge about birth control procedure.

**Family dependency ratio :** In the study more or less half of the respondents were moderately dependent on their earning family members. Because sidr destroyed their earning sources, as a result most of the people were unemployed

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and they were dependent on their single earning family member for living. Sixteen percent respondents had low dependency ratio because they mitigate their losses in short period of time after destruction caused by sidr. Thirty six percent of the respondent were highly dependent on their family, because their earning members were died on sidr and their were vary low number of earning in their family.

**Farm size :** Farm size of the respondent in sidr affected farmers ranged from 0 to 11.17 with a mean value of 1.37 and standard deviation of 1.59. On the basis of their assets score the respondent were classified into five categories shown in Table 2. Data presented in Table 2 shown that majority 45% are small farm size, 42% medium, 3% marginal, 1 percent small and 9% were large farm size. The percentage of respondents having small and medium farm size were more than that of landless, marginal and large farm size in the study. Because, people with small and medium farm size were mostly involved in agriculture for their living. This research emphasized on the landless and marginal farmers who were less dependent on agriculture. They were mostly dependent on earning from labour, shopkeeping and small business for their living.

**Table 3. Categorization of the respondent according to the livelihood assets regarding different capitals**

Sl. No	Capital endowments	Range		Sidr affected farmers (n=100)*		Mean	SD
		Possible Score	Observed Score	Categories	%		
1.	Human capital	0-9	3-8	Low ( $\leq 3$ )	5	5.19	1.11
				Medium (4-6)	84		
				High ( $> 6$ )	11		
2.	Financial capital	0-6	1-6	Low ( $\leq 2$ )	71	1.92	1.29
				Medium (3-4)	24		
				High ( $> 4$ )	5		
3.	Social capital	0-9	2-7	Low ( $\leq 3$ )	40	3.87	0.99
				Medium (4-6)	59		
				High ( $> 6$ )	1		
4.	Natural capital	0-9	3-9	Low ( $\leq 3$ )	2	6.51	1.54
				Medium (4-6)	56		
				High ( $> 6$ )	42		
5.	Physical capital	0-45	6-29	Low ( $\leq 15$ )	23	18.64	4.90
				Medium (16-30)	77		
				High ( $> 30$ )	0		

\*Number and percent of the respondent are the same

**Annual family income:** The annual family income score of the respondent ranged from 0 to 460 with a mean of 85.07 and a standard deviation of 94.74. On the basis of family income the respondents were classified into three groups as shown in Table 2. Data present in the Table 2 shown that the highest proportion of the respondents (44%) had low family income while only 28% of the respondents had medium family income and 28% respondents had high family income in the study area.

**Table 4. Relationship between characteristics of Sidr affected farmers and their livelihood assets**

Dependent variable	Independent variable	'r' values with 98 df
Livelihood assets	Age	0.026
	Education	0.007
	Family size	0.127
	Family dependency ratio	0.068
	Farm size	0.299**
	Family income	0.402**
	Extension media contact	0.326**
	Livestock and poultry possession	0.119

\*\*Correlation is significant at the 0.01 level of probability

**Extension media contact:** The extension media contact score of the respondents varied from 0 to 48 against a possible score ranged from 5 to 24. The mean were 12.96 and standard deviation of 3.76. On the basis of extension media contact the respondent were classified into three categories as shown in Table 2. Majority of the respondents (82%) had low media contact while 18% of them had media and zero percent had high media contact.

**Livestock and poultry possession:** The livestock and poultry possession scores of the respondents ranged from 23 to 51, the mean and standard deviation were 36.13 and 6.11, respectively. On the basis of the respondents they were classified into three categories as shown in Table 2. Findings shown in Table 2 indicated that about three-fourths (66%) of the respondents had fair number of livestock and poultry while 17% had poor and another 17% had good poultry possession. Sidr destroyed not only physical properties of the farmers but also their livestock and poultry resources. Thousands of cattle, goats, ducks, hens and other pet birds were found dead after sidr.

#### ***Livelihood assets of the Sidr Affected Farmers***

**Livelihood assets regarding different capitals:** Livelihood assets of sidr affected farmers were the dependent variable of the study. Livelihood assets of the farmers were measured in respect of five dimensions or assets namely natural, physical, human, financial and social capital. The natural asset had 3 items, physical 15 items, human 3 items, financial 2 items and social 3 items. Thus, a total of 26 items were used to investigate the livelihood assets. Each of the items was measured against 4-point rating scale scored as 0 for not at all, 1 for inadequate, 2 for moderate and 3 for adequate.

#### ***Livelihood assets regarding human capital***

Livelihood assets concerning human capital were ascertained by checking their livelihood in three selected items and the possible score ranged was 0 to 9. However, the obtained score ranged from 3 to 8. On the basis of their livelihood assets for financial capital scores, the respondents were classified into three categories as shown in Table 3.

#### ***Livelihood assets regarding financial capital***

Livelihood assets regarding financial capital was ascertained by checking their extern of livelihood assets in two selected statements and the possible score ranges was 0 to 6. However, the obtained score ranges from 1 to 6. On the basis of their livelihood assets on financial capital scores, the respondents were classified into three categories as shown in Table 3. Data presented in Table indicated that majority (71%) of the respondents faced Sidr with low livelihood assets on their financial capital. Twenty four percent were found to be faced Sidr with medium livelihood assets and there 4% were high livelihood assets.

#### ***Livelihood assets regarding social capital***

Livelihood assets regarding social capital was ascertained by checking their extent of livelihood assets in three selected statements and the possible score ranges was 0 to 9. However, the obtained score ranged from 2 to 7. On the basis of the effect on social capital scores, the respondents were classified into three categories as shown in Table. Data presented in Table 3 indicated that majority (59%) of the respondents faced sidr with medium livelihood assets on their social capital. Forty % were found to be faced sidr with low livelihood assets. There was only one % had livelihood assets concerning social capital.

#### ***Livelihood assets regarding natural capital***

Livelihood assets regarding natural capital was ascertained by checking their extent of livelihood assets in fifteen selected statements and the possible score ranges was 0 to 9. However, the obtained score ranged from 3 to 9. On the basis of the livelihood assets on natural capital scores, the respondents were classified into three categories as shown in Table. Data presented in Table 3 indicated that majority of the respondents (56%) faced sidr with medium livelihood assets on their natural capital and 42% were found to be faced Sidr with high livelihood assets. There only 2% facing Sidr with low livelihood assets.

#### ***Livelihood assets regarding physical capital***

Livelihood assets regarding physical capital was ascertained by checking their extent of livelihood assets in five selected statements and the possible score ranges was 0 to 45. However, the obtained score ranged from 6 to 29. On the basis of their livelihood assets regarding physical capital scores, the respondents were classified into three categories as shown in Table 3. Data presented in Table 3 indicated that majority of the respondents (77%) had medium livelihood assets. There was not found any one facing Sidr with high livelihood assets.

### **Overall livelihood assets**

The total score of livelihood assets of sidr could range from 0 to 78. The observed livelihood assets score ranged from 23 to 51 with a mean of 36.13 and standard deviation 6.11. Based on the overall livelihood assets scores the respondents were classified into three categories as shown in Table 3

### **Relationships between the Selected Characteristics of Sidr Affected Farmers and their livelihood assets on sidr**

Pearson's product Moment correlation coefficient (r) was computed in order to explore the relationship between the selected characters of the sidr affected farmers and their livelihood assets. The relationship between the dependent and independent variable has been presented in Table 4.

### **Summary findings, Conclusion, Recommendation**

Age of the respondents were found to vary from 22 to 75 years with a mean of 49.67 years and standard deviation of 11.17. Majority(58%) of the people fell in the old category, while 4 and 38% belonged to young and middle aged categories, respectively. Thirty seven percent of them had primary level of academic qualification while 37 and 19% had secondary and above secondary level of education. Average family size of the respondents was 5.44 and about half of the respondents fell under small family. The mean value of family dependency ratio was 3.90 and about half of the respondent had medium dependency ratio. The mean value of farm size of the respondent was 1.37 and majority(45%) of the respondent had small farm size. The average annual family income of the respondent was 85.07 and majority(44%) of the respondent had low family income. The average extension media contact respondent was 12.96 and most (82%) of the respondents had low media contact. The mean value of livestock and poultry possession was 36.13 and about two thirds (66%) of the respondents had fair livestock and poultry possession.

Almost all the respondents were middle aged to old having primary to secondary level of education. They had mostly small to medium farm size with low to medium family income and extension media contact. These categories of farmers were the major victims of Sidr. They possessed the criteria of being target group for any developmental activities taken by government or private initiatives. Livelihood assets of the Sidr affected farmers were increased with the increase of their farm size annual family income and extension media contact. Most of the respondents had small to medium farm size with low to medium family income and extension media contact. Therefore, there is an opportunity to improve their livelihood assets through making their land tenure, family income and media contact favourable.

Lack of dwelling house, unhygienic drinking water, outbreak of diarrhoea, cholera etc., insufficient relief and increased salinity of soil were the major problems faced by the farmer to mitigate the hazardous effect of sidr. These problems are the main foci of any program for the betterment of the farming systems of the Sidr affected farmers.

Score for livelihood assets of the Sidr affected farmers ranged from 23 to 51 against a possible range of 0 to 78. The average livelihood assets were 36.13. Most(66%) of the respondents were in medium livelihood assets category while 20 and 14% of them were in low and high categories respectively. Most of the sidr affected farmers had low to medium level of livelihood assets. Livelihood assets of the respondents regarding human and natural capital was medium to high but this was low to medium in case of financial, social and physical capital.

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