FLOOD COPING STRATEGIES OF THE ULTRA-POOR FARMERS IN *HAOR* AREAS OF SYLHET DISTRICT

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Abstract

The study was undertaken to determine the flood coping strategies practiced by the inhabitants of *Haor* farmers particularly the ultra-poor farmers. Data were collected from a randomly selected sample of 80 ultra-poor farmers of two villages Goyasi and Belkuna under Fenchuganj upazila of Sylhet district by using a pre-tested interview scheduled from 24 August 2017 through 3 October 2017. The study revealed that the ultra-poor's flood coping strategies centered on six major issues: crop production, life security, livestock and poultry, housing and shelter, means of livelihood, health and sanitation. Cultivation of short-duration rice variety ranked top, followed by collecting good quality seedlings from the nursery, using tube-well water to avoid water borne diseases, and earthen up homestead area. On the other hand, keeping the children away from flood water ranked sixth. However, the co-efficient of correlation indicated that annual family income and training received had a significant relationship in flood coping strategies of the ultra-poor farmer.

Keywords: Flood coping strategy, Ultra-poor farmer, Haor.

Introduction

Flood is a natural calamity and an annual phenomenon in Bangladesh. In every year, Bangladesh suffers from flood and is normally associated with the yearly monsoon rains, which pour into the entire Ganges-Brahmaputra-Meghna basin (BWDB, 2014). About 60% of land in Bangladesh is flood-prone while 25% areas in Bangladesh are inundated by monsoon flood water between June and October every year (Anonymous, 2002). Bangladesh generally experiences four types of floods: flash flood, rain flood, river flood and storm-surge flood (Mirza, 2002; BWDB, 2011). Flood occurs where natural drainage systems have been clogged by various human interferences e.g., unplanned and rapid urbanization, while construction of unplanned roads and encroachment of river courses and water bodies etc. are responsible for rain-fed floods (Master Plan of Haor Area, 2012). However, in eastern and northern Bangladesh, especially the foothills and *Haor* basin in Sylhet, Moulvibazar, Sunamganj, Habiganj, Kishoreganj, Netrokona, Rangamati, Bandarban, and Khagrachari flash flood and rain flood are frequent, which severely devastated crop fields in the year of 2002, 2004, 2007, 2009, 2010, 2016 and 2017. During floods, roads, bridges, farms, houses, and automobiles are destroyed and people become homeless. Many people and animals died during those floods. Many more are injured, and others become homeless (BWDB, 2010). Water supply and electricity are disrupted, and people struggle and suffer from a lot of diseases and infections including military fever, pneumonic plague, and dysentery (BWDB, 2010). As communication links and infrastructure such as roads and bridges are damaged and disrupted, economic activities come to a standstill, resulting in dislocation and the dysfunction of normal life for a period much beyond the duration of the flooding.

The ultra-poor farmer of the study area of Fenchuganj is fully dependent on agriculture and situated near the Hakaluki haor where flood attack unpredictably and severely and also damages agricultural crop with a large amount and imprint a severe impact on the national economy of the country. Last several years after the liberation war in 1974, 1988, 1998, 2004 and 2010 flood attacks severely in *Haor* region and damaged huge amounts of agricultural production especially in the Boro season (Master Plan of Haor Area, 2012). The affected people also lost their stocks of food, grain, seeds and agricultural implements; they left their houses and took shelter on the high roads or ground where they have charity. Due to the lack of enough facilities, ultra-poor farmers have faced the cruelties of hunger, malnutrition, accommodation & unemployment problem (Khatun, 2009). The cruelty of flood so high may be due to the inability of the ultra-poor farmers to cope with flood properly. Moreover, various characteristics including, personal, socio-economic, socio-communicative, and socio-psychological characteristics of the ultra-poor farmers would have an influence on their flood coping strategies. In view of this context, the study was planned to determine flood coping

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strategies of the ultra-poor *Haor* farmers, and explore the relationship between their characteristics and coping strategies.

Materials and Methods

The study was conducted in two villages namely Goyasi and Belkuna of Fenchuganj upazila under Sylhet district. The adjacent *Haor* and water bodies were Hakaluki (one of the largest *Haor* in the country), Dhuburia *Haor*, Baraiya beel, Tengra beel, and the Kushiyara river which flooded the surrounding areas almost every year. In order to collect relevant data for the study, a well-structured interview schedule was carefully prepared to keep the objectives in mind. The interview schedule was pre-tested with 10 ultra-poor farmers from the study area by the researcher before finalizing the questions for collection of data. About 470 ultra-poor farmers constituted the population for the study of above two villages. From this population 17% farmers of these villages were selected randomly as the sample for the study. Thus, data were collected from 80 randomly selected ultra-poor farmers from 24 August through 3 October, 2017.

For determining the flood coping strategy of the ultra-poor farmers a Focus Group Discussion (FGD) was conducted in the study area. In this way, a total of 24 practices were identified as the most used flood coping strategies of the ultra-poor farmers of the *Haor* area and finalized from pre-tested results. A four-point rating scale was set against each item to determine the extent of use of each practice. In this way the score for 24 practice items of a respondent varied 11 to 45 against the possible score 0 to 72.

In order to rank each of 24 practices Coping Strategy Index (CSI) was calculated with the formula described below:
$$CSI = Cn \times 0 + Cl \times 1 + Cm \times 2 + Ch \times 3$$

Here,
CSI= Coping Strategy Index
Cn= Frequency of the farmers who rated the practice as not encountered
Cl= Frequency of the farmers who rated the practice as low
Cm= Frequency of the farmers who rated the practice as medium
Ch= Frequency of the farmers who rated the practice as high

The average number of Coping Strategy Index (CSI) is called Average Coping Strategy Index (ACSI). The collected data were analyzed using SPSS (Statistical Package for Social Science) software version 20, including descriptive and inferential statistical measures such as range, frequency, number, percentage, mean, standard deviation (SD), and rank order for categorizing and describing the variables. Statistical tools, such as Pearson's Product Moment Correlation Co-efficient (r). The chosen significant levels were equal to or less than the 0.05 level of probability.

Results & Discussion

Growers' ranking of Coping Strategy Index (CSI)

The Data presented in Table1 revealed that the strategy related to crop production (ASCI =143) was prominently practiced compared to the other aspects. As lands in the *Haor* area remain water logged for 6-7 months, and Boro rice is the only crop of almost 80% area (Rana, 2009), securing this crop from the flood has been their top priority which was evident by CSI score of short duration rice variety (CSI=230). The next emphasized strategy was related to post flood recovery management- collecting good quality seedlings from nurseries (CSI=229). Although the respondents as the flood coping strategies those were the least practiced strategies (CSI = 73 and 40, respectively). The life security aspect ranked second depending on the ASCI score (112). The ASCI for other aspects were 107, 97, 76, and 63 for 'health and sanitation', 'means of livelihood', 'housing and shelter', and 'livestock and poultry rearing'. For the security of life, the ultra-poor emphasized more on keeping their children away from flood water (CSI=134), collecting medicine for flood-related diseases like diarrhea, and dysentery (CSI=109), and preventing snakes by using traps (CSI=94).

The ultra-poor farmers' strategy for maintaining health and sanitation emphasized using tube-well water to avoid water borne diseases (CSI=162), but the use of boiled water and harvesting of rainwater for drinking were evident as the least practice strategy (CSI 48 and 64, respectively). As the ultra-poor were mostly peasants and laborers, most of them migrated to other places leaving their homes during the inundation period, and engaged themselves in low-paid works like rickshaw pulling, van driving etc. in an urban and semi-urban areas. The rest who remained in their locality.

Table 1. The rank order of different flood coping strategies of the farmers.

SL No.	Aspects	Strategies	Extent of use (N=80)				CSI	AC SI	Rank
			High	Medium	Low	Not at all			
1.	Crop production	Cultivation of short-duration crop variety	71	8	1	0	230	143	1st
		Cultivation of flood-resistant crop variety	13	7	20	40	73		
		Collecting good quality seedlings from the nursery	69	11	0	0	229		
		The practice of mixed cropping	7	6	7	60	40		
2.	Life security	Using a trap for preventing snake	20	11	12	37	94	112	2nd
		Collecting essential medicine	17	20	18	25	109		
		Keep the children away from water	26	24	8	22	134		
3.	Health and sanitation	Boiling water for drinking and cooking	7	10	7	56	48	107	3rd
		Using tube well to avoid water born disease	45	10	7	18	162		
		Use of rainwater for drinking	8	14	12	46	64		
		Using tube well for bath and other work	42	8	3	26	148		
		Using sanitary toilet	29	7	12	32	113		
4.	Means of livelihood	Migrate to semi-urban and urban areas for works	35	11	5	29	132	97	4th
		Borrowing money for major food items	24	19	11	26	121		
		Mortgaging essential household chores to relatives	11	8	14	47	63		
		Taking money and food items from well-being person promised to work in their crop field whenever they call	9	14	15	42	70		
5.	Housing and shelter	Earthen up of homestead area	34	23	8	15	156	76	5th
		Selling removable assets from flood damage	4	11	18	47	52		
		Taking flood shelter when the house is severely flooded	1	6	4	69	19		
6.	Livestock and poultry rearing	Selling livestock and poultry	10	5	6	59	46	63	6th
		Keeping away livestock and poultry	7	8	12	53	49		
		Use of vaccine for cattle and poultry	11	11	16	42	71		
		Managing feed for cattle	13	10	7	50	66		
		Treatment of diseased animals during and after the flood	15	16	5	44	82		

continued their livelihood by mortgaging essential household chores to relatives, borrowing money from local businesses and traders and sometimes cash was taken from riches on condition to work in their fields whenever they called upon them. For coping with flood impacts the housing and shelter-related strategies were earthen up homestead area (CSI=156), ranked fifth in the housing and shelter aspects followed by earthen up of homestead area (CSI=156), selling removable assets from flood damage (CSI=52), taking flood shelter when the house is severely flooded (CSI=19). In the *Haor* area, poultry and livestock are neglected sectors because of frequent floods and prolonged waterlog. Most ultra-poor were found seasonally and occasionally engaged in livestock and poultry rearing. Their strategies were selling livestock and poultry (CSI=46), keeping away livestock and poultry (CSI=49), use of the

vaccine to avoid the disease of cattle and poultry (CSI=71), managing feed for cattle (CSI=66), treatment of a diseased animal during, and after flood (CSI=82).

Extent of use of the identified flood coping strategies by the farmers

There were 24 strategies of ultra-poor farmers, the score of each farmer for practicing those strategies ranged from 11 to 45 with an average of 29.54 and standard deviation of 8.6 against the possible score 0 to 72. About 56% of the ultra-poor had practiced these strategies at a medium level while 16% had a high level and the rest 28% had a low level (Table 2).

Table 2. Flood coping strategies of the farmers depend upon the extent of use.

Categories (score)	Number	Percent	Mean	Standard deviation
Low use of strategy (up to 25)	22	27.5	29.54	8.602
Medium use of strategy (26-38)	45	56.3		
High use of strategy (>38)	13	16.3		
Total	80	100		

Data from the table 3 revealed that, the age and farm size of the respondents were insignificant and negative. It means that, age and farm size had no significant relationship with flood coping strategies of ultra-poor farmers in the *Haor* area. It also means that, age and farm size did not effect on their flood-coping strategy.

The level of education, family size, and extension media contact of the respondent were insignificant. That means, education level, family size, and extension media contact of the ultra-poor farmers were not directly related to flood coping ability.

Table 3. Pearson's product moment correlation co-efficient (r) analysis.

Dependent variable	Selected characteristics	Correlation co-efficient 'r' values with 78 df	Tabulated value of 'r' at 78 df	
			0.050 level	0.01 level
Ultra-poor farmers flood coping strategy	Age	-0.191	0.220	0.287
	Level of education	0.050		
	Family size	0.105		
	Farm size	-0.071		
	Annual family income	0.635**		
	Extension media contact	0.166		
	Training received	0.336**		

**r value at 1 percent (0.01) level with 78 df.

On the other hand, annual family income and training received of the respondents were positively significant at a 1 percent (0.01) level. It means that, with the increase of annual income of the farmers, their practice in flood coping increases because more income drives the farmers to meet their different needs and to effort more strategies for future. When farmers receive different types of training (i.e. dapog seedbed, health and sanitation, disaster management, small-scale income generation), their skill increases, and they become more aware of their livelihood in a flood-prone area. Rana (2009), Khatun (2009), and Islam (2005) also found that annual family income and training had a significant and positive relationship with flood coping ability of ultra-poor farmers in the *Haor* area.

Conclusion

The study reveals that, the majority (56.3%) of the ultra-poor farmers in the study area had medium flood coping strategies, while 27.5% of them had low and only 16.3% had high flood coping strategies respectively. Therefore, it may be concluded that the coping behavior of the ultra-poor farmers with respect to flood is not satisfactory, but there is further scope for increasing through proper initiatives from concerned organizations. It may be necessary to increase the education level of the ultra-poor farmers to their awareness of increasing coping strategies for flood. The ultra-poor farmer's coping capability increased with the increase of their annual income. The creation of more income-generating activities for the ultra-poor farmers can increase their coping capability with the flood. Moreover, the farmers with more training exposure with different organizations are expected to have more coping strategies with the flood. As

most of them are day laborer peasants, agriculture-related training will have more impact on increasing income and thereby the flood coping capacity.

It was found that, ultra-poor farmers were using several types of flood coping strategies to cope with the flood. For increasing the coping capability, the number of flood shelters should be increased also a number of measures need to be taken both by major intervening agencies, such as governmental organizations (GOs) and non-governmental organizations (NGOs). Adequate technical support, training and other instructional activities should be undertaken and continued in order to make them capable of better coping of flood. The ultra-poor farmer could not save their farm products and livestock during the flood. The Department of Agricultural Extension (DAE), the largest public sector extension agency, along with the Department of Livestock Services (DLS) should come forward to launch an appropriate extension campaign and support for the ultra-poor farmers in the flood-prone *Haor* areas.

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