Contribution of the Characteristics of the Disaster Affected People to Practice the Disaster Coping Strategies

ABSTRACT

A study was carried out at Gangachara*Upazila* of Rangpur district, Bangladesh during September to December/2016 to find out the contribution of the characteristics of the affected people to the practice of coping strategies during disaster. Data were collected from a sample of 302 respondents, randomly selected from disaster affected populationthrough both qualitative and quantitative techniques. Out of the nineteen selected personal, economic, social and characteristics of the disaster affected people, fourteen were found positive, two were negative and three had no significant relationship with their disaster coping strategy practice. Stepwise multiple regression analysisrevealed that six variables namely education (23 percent), income generating activities (3.6 percent), awareness about social safety net program (2.9 percent), disaster affected land (1.2 percent), farm size (1.9 percent) and perception of climate change (1.0 percent) were the major contributing variables which combinedly explained 33.6 percent of total variations.Path analysis revealed that among the variable's disaster affected land had the highest direct positive value (0.589) and farm size was the highest total indirect effect of (0.643) on disaster coping strategy practices. Considering the relative contribution on the disaster coping strategies practiced by the affected people, the six variables could arrange as follows disaster affected land> education>participation in income generating activities> awareness about social safety net program> perception of climate change> farm size.

Key words: Characteristics, contribution, disaster coping.

INTRODUCTION:

The people of Bangladesh have adapted over generations to the risks of floods, droughts and cyclones by practicing numerous disaster coping strategies. The combination of frequent natural disasters, high population density, poor infrastructure and low resilience to economic shocks, makes Bangladesh especially vulnerable to climatic risks. A lack of awareness and coordination among the people of Bangladesh about disaster preparedness, climate change, and its impact on the environment and human lives has made the Bangladeshi population even more susceptible to the effects of disaster. Although they have limited options, people are

increasingly searching for alternative livelihood strategies to adapt to the reality of severe disruption of their livelihoods.The climate change is posing challenge to the livelihoods in different ways. People of the study villages have learned to cope with disasters in their own ways.But human personality is the most complex and fascinating phenomenon. All the influencing factors of coping strategies regarding better livelihood cannot be dealt within a single study.An individual's characteristic patterns to a considerable extent determine the attitude and influence in decision-making relating to almost every behavioral manifestation in life (Haque, 2014). In this study 19 personal, economic, social and psychological characteristics of the farmers that were dealt and considered as independent variables. Sarker (2010) and *Haque (2014) found both negative and positive relationship between respondentsselected characteristics and their flood coping strategies. Shahiduzzaman (2012) also found the same findings in case of study the food security condition in a char area of Rangpur district.From the above discussion, the present study has been undertaken to find out the characteristics of affected people that contributed on their disaster coping strategies towards better livelihood.

METHODOLOGY:

The study was carried out at Gangachara*Upazila* of Rangpur district, Bangladesh during September to December/2016 to 2012 to find out the contribution of the characteristics of the affected people to the practice of coping strategies during disaster. Historically, Gangachara*Upazila* is familiar to a habitat of fragile economy, extreme poverty and chronic food insecurity. Thisdisaster-prone (affected by flood, drought, river erosion and different kinds of storms) study area is located between $25^0$48' and 25^0 57' north latitudes and between 89^0 05' and $89^0$21' east longitudes. The yearly averagetemperature, rainfall and humidity are found in vulnerable condition and it is 30.2^0, rainfall 244 mm and humidity 82 percent respectively. Data were collected from a sample of 302 respondents, randomly selected from disaster affected populations through both the qualitative and quantitative techniques.In order to find out the contribution of 19 selected characteristics such as age, education, family size, farm size, disaster affected land, annual income, training received, extension

media contact, knowledge on disaster coping strategy, environmental awareness, household assets, credit facilities, participation in income generating activities, water and sanitation condition, risk orientation, awareness about social safety net program, perception of climate change, perception of disasters and scope of work in vulnerable situation constituted the independent variables, while disaster coping strategy practiced was the dependent variable.To explore the relationship between the focus variable and the characteristics of the disaster affected people, Pearson's product moment correlation coefficient (r) was computed first. Then regression analysis was run to determine the independent variables that responsible for better livelihood during disaster period. Stepwise multiple regression analysis finally computed to determine the actual contribution of the selected independent variables to the dependent variable. Path analysis was also conducted to assess the direct and indirect effects of the independent variables on dependent variable.

RESULTS AND DISCUSSIONS

1. Relationship between selected characteristics of the respondents and their disaster coping strategy practice

Out of the nineteen selected characteristics of the disaster affected people, fourteen were found having positive andtwo were negative significant relationship with their disaster coping strategy practice (Table 1) by the affected people on their livelihood, these are age (-.206**), education (.479**), farm size (.154**), disaster affected land (176**), annual income (.157**), household assets (.165**), participation in income generating activities (.343**), training experience (.421**), extension media contact (.384**), water and sanitation condition (-.023),environmental awareness (.287**), knowledge on disaster coping strategy (.403**), credit received (.123*), scope of work in vulnerable situation (.120*), awareness about social safety net programs (.451**), perception of climate change (.284**), perception of disasters (.123*).The coefficient of correlation only indicates the linear relationship between two variables. It does not express the influence and contribution of a particular independent variable to the dependent variable. The independent variables in isolation did not give a comprehensive picture of the influence of independent variables on the level of

disaster coping strategy practices. The different characteristics of the respondents may interact together to contribute to a combined influence on disaster coping strategy practices of a program in vulnerable situation. Keeping this fact in view linear multiple regression analysis was used to assess the influences of the independent variables on the dependent variable. A general full model regression analysis was initially run with the sixteen independent variables.It was observed that there was the existence of inter-correlation among the independent variables. Such inter correlations among the independent variables violate the assumption of the classical linear regression model. Hence, there may have the possibility of multicollinearity problem for which proper influences of the variables might not have expressed exactly and the regression results were misleading. In this context, Cohen (1975) mentioned, "When some or all of the variables are substantially correlated with each other, the coefficient obtained for the entire set may be highly misleading.''

However, in order to avoid the above mentioned misleading results the method of step-wise multiple regression was employed. All the six independent variables were fitted together in step-wise multiple regression analysis. According to Droper and Smith (1981)."Purpose of step-wise multiple regression analysis is to insert variables in turn until the regression equation is satisfactory."

Table 1. Relationship between selected characteristics of the respondents and their disaster coping strategy practice

Focus variable (Dependent variables)	Characteristics of the disaster affected people (Independent variables)	Coefficient of correlation (r)
Disaster Coping StrategyPracticed by the Affected People	Age	-.206**
	Education	.479**
	Family size	.031
	Farm size	.154**
	Disaster affected farm	.176**
	Annual income	.157**
	Household assets	.165**
	Participation in income generating activities	.343**
	Training experience	.421**
	Extension media contact	.384**
	Water and sanitation condition	-.023
	Environmental awareness	.287**

	Knowledge on disaster coping strategy	.403**
	Credit received	.123*
	Scope of work in vulnerable situation	.120*
	Awareness about social safety net program	.451**
	Risk orientation	.074
	Perception of climate change	.284**
	Perception of disasters	.123*

** Significant at .01 level, * Significant at .05 level

2.Contribution of the selected characteristics of the disaster affected people to practice the disaster coping strategies

Linear multiple regression analysis was computed in order to determine the contribution of various characteristics of disaster affected peopleto their coping strategies towards disasters.Outof 16 independent variables, only six, namely education, farm size, disaster affected land, participation in income generating activities, awareness about social safety net programs, perception of climate change were entered into the best fittedmodel of regression analysis(both positive and negative)) and all these six variables were found to be significant. Hence, the concerned null hypotheses were rejected(Table 2).

Table 2.Regression co-efficient of extent of practice of disaster coping strategy with the independent variables in the linear multiple regression models

Independent variables	Unstandardized co-efficients	Standardized co-efficients	t values	Signifi-cant level
	B	Beta		
Age	-.035	-.051	-.920	.359
Education	.790	.184	1.967	.057
Farm size	-16.502	-.520	-2.809	.005
Disaster Affected Farm	22.186	.629	3.498	.001
Annual income	.069	.090	1.668	.096
Household assets	-.050	-.055	-.939	.349
Participation in IGAs	.527	.190	3.368	.001
Training experience	-.006	-.004	-.055	.956
Extension Media Contact	.140	.037	.479	.632

Environ. Awareness	.104	.042	.740	.460
Knowledge of DCS	.106	.042	.522	.602
Credit received	.022	.015	.266	.790
Scope of work	.297	.038	.734	.464
Awareness about SSNP	.468	.152	2.192	.029
Perception of CC	.656	.101	1.825	.059
Perception of disasters	.147	.071	1.424	.155

Constant = 70.450, R^2 =0.354, Adjusted R^2 =0.317, F value=9.745, P= 0.000

3. Coping Strategy Model

Referring to the statistics given in Table 3 The regression model for coping strategies towards disaster is as follows:

$Y=76.601 +0.975X_2 -15.611X_4 +20.847X_5 + 0.584X_8+0.516X_{16} +0.725X_{18}$

Where, Y=Disaster coping strategies practices

X_2= Education, X_4=Farm size, X_5 = Disaster affected land, X_8=Participation in IGAs, X_{16}=Awareness of social safety net programs, X_{18}= Perception of climate change

Data contained in Table 3 and 4 indicated that the whole model of 16 variables explained 35.4 per cent of the total variation of disaster coping strategy practices in vulnerable situation, whereas only six variables explained 33.6 per cent of the variation. But, since the six variables formed the equation, it might be assumed that whatever the contribution was there it was due to these six variables.

Table 3.Regression coefficients of disaster coping strategy practices with the six significantly contributing independent variables

Variable Code	Individual characteristics	Unstandardized co-efficient		Standardized co-efficient	t values	Signific-ant Level
		B	Std. error	Beta		
X_2	Education	.975	.256	.268	3.812	.000
X_4	Farm size	-15.611	5.561	-.492	-2.807	.005
X_5	Disaster affected land	20.847	6.151	.591	3.389	.001

X_8	Participation in IGAs	.584	.145	.211	4.015	.000
X_{16}	Awareness of SSNPs	.516	.205	.168	2.512	.013
X_{18}	Perception of CC	.725	.343	.111	2.116	.035

Constant = 76.601, R=0.580, R^2 =0.336, Adjusted R^2 =0.323, F value=24.910, P=0.000

The above findings indicated that only six variables were mainly responsible for the extent of practice of disaster coping strategy for the affected people in vulnerable situation due to climate change. The unique contribution of each of the six variables was also determined by taking the changes in R^2value occurred for entry of a particular variable in the step-wise regression model. Table 4 indicated that education alone contributed 23 percent of the variation followed by participation in income generating activities (3.6 percent), awareness of social safety net programs (2.9 percent), disaster affected land (1.2 percent), farm size (1.9 percent), perception of climate change (1 percent).

The model formulated from the regression analysis meant that the disaster coping strategy practices for the affected people had inherent disaster coping strategy practices 76.601 in comparison of the mean 107.26.It was evident from the model that "The affected people who had more education, more active participation in income generating activities, more perception on climate change, more awareness of social safety net programs, more conscious about disaster affected land and more farm size in the char land in the disastrous period was more associated with disaster coping strategy practices in the study area".

Table 4.Changes in multiple R^2 for enter of a variable into the step-wise multiple regression analysis models for disaster coping strategy practices

Variables entered	R^2	R^2 change	Variance explained (%)	Significance Level
Education	.230	.230	23	.000
Participation in IGAs	.266	.036	3.6	.000
Awareness of SSNPs	.295	.029	2.9	.001
Disaster affected land	.307	.012	1.2	.021

Farm size	.326	.019	1.9	.004
Perception of CC	.336	.010	1.0	.035

4.Path analysis for measuring direct and indirect effects of selected independent variables on disaster coping strategies practices

In the present study, 'path analysis' was done to have clear understanding of direct and indirect effects of selected 6 variables which were entered into the stepwise regression model on the extent of practice of disaster coping strategy for their livelihood of the affected people due to climate change in the following way: at first the correlation matrix with path coefficient (p) of six significant characteristics were prepared.In fact path-coefficient, p is an inherent correlation owned by the respondent in automatic manner. It is the direct effect of specific characteristics on dependent variable and the indirect effects of other characteristics working in group are obtained by multiplying the column values and the standard coefficient (β) value of each variable. Variables through which substantial indirecteffects were channelled were also explored. The 'path coefficient' of selected independent variables with respect to disaster coping strategy practices is shown in Table 5.

Table 5. Path coefficients showing the direct and indirect effects of selected independent variables on the extent of practice of the disaster coping strategies

Independent variables	Effect of independent variable		Variable through which substantial indirect effects were channelized	
	Direct	Total Indirect		
Education (X_1)	0.267	0.209	0.072	IGAs (X_2)
			0.113	SSNP(X_3)
			-0.022	Farm size (X_4)
			0.0018	DA. land (X_5)
			0.044	CC. per (X_6)
Income generating activities (X_2)	0.212	0.130	0.090	Education (X_1)
			0.039	SSNP(X_3)
			-0.117	Farm size (X_4)
			0.114	DA. land (X_5)
			0.0043	CC. per (X_6)

Awareness about social safety net programs (X_3)	0.167	0.284	0.182	Education (X_1)
			0.050	IGAs (X_2)
			-0.060	Farm size (X_4)
			0.070	DA. land (X_5)
			0.042	CC. per (X_6)
Farm size (X_4)	-0.489	0.643	0.012	Education (X_1)
			0.051	IGAs (X_2)
			0.020	SSNP(X_3)
			0.565	DA. land (X_5)
			-0.0048	CC. per (X_6)
Disaster affected land(X_5)	0.589	-0.414	0.0008	Education (X_1)
			0.041	IGAs (X_2)
			0.019	SSNP(X_3)
			-0.470	Farm size (X_4)
			-0.005	CC. per (X_6)
Climate change perception (X_6)	0.113	0.171	0.104	Education (X_1)
			0.0081	IGAs (X_2)
			0.062	SSNP(X_3)
			0.021	Farm size (X_4)
			-0.024	DA. land (X_5)

Data indicated that 6 variables namely education, participations in income generating activities, awareness about social net programs, farm size, disaster affected land, perception of climate change had direct positive and negative effect on the extent of practice of disaster coping strategy for their livelihood of the affected people due to climate change. Among the variables disaster affected land had the highest direct positive value (0.589) on disaster coping strategy practices and its total indirect effect was -0.414, which was exerted through education (0.0008), farm size (-0.470), participation in income generating activities (0.041), awareness about social safety net programs (0.019) and perception of climate change (-0.005). Farm size had the second highest direct negative effect (-0.489) on disaster coping strategy practices. The total indirect effect of farm size was (0.643) which was exerted through education (0.012), disaster affected land (0.565),participation in income generating activities (0.051), awareness about social safety net programs (0.020) and perception of climate change (-0.0048).

Among the six variables mentioned above education, participation in income generating activities and disaster affected land had more direct effects than their indirect effects, while farm size, awareness about social safety net programs and perception of climate change had more indirect effects than their direct effects on disaster coping strategy practices.

CONCLUSION

Among the 16 factors those were significantly correlated with coping strategy, only six factors,namely education, participations in income generating activities, awareness about social net programs, farm size, disaster affected land, perception of climate change had significant contribution to practice the coping strategy during any disaster for their livelihood. According to the regression model it was evident that the disasteraffected people who had more education, more active participation in income generating activities, more perception on climate change, more awareness of social safety net programs, more conscious about disaster affected land and more farm size in the char land in the disastrous period was more associated with disaster coping strategy practices in the study area.

RECOMMENDATIONS

Considering the relative contribution on the disaster coping strategies practiced by the affected people, the six variables could arrange as follows disaster affected land> education> participation in income generating activities> awareness about social safety net program> perception of climate change> farm size. Thus, it can be stated that most of the variables related to household income which play a vital contribution towards increasing effectiveness of disaster coping strategy practices by the affected people during disaster period. Both GO and NGOs can make better contribution in this area of development through dispersing soft loan, training, motivation etc.

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