



Study of the Characteristics of Farmers on Practicing Coping Strategies towards Household Food Security during Flood Period

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

A study was carried out at flood affected riverine villages of three upazilas under Jamalpur district in Bangladesh during September, 2011 to May, 2012 to explore the relationship, contribution and direct-indirect effect between personal attributes and their coping strategies towards household food security practiced by the farmers during flood. Data were collected from randomly selected respondents through both the qualitative and quantitative techniques and analyzed with the help of SSPS. Out of 18 personal, economic, social and psychological characteristics of the farmers, the

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personal education, housing condition, annual income, annual expenditure, savings, organizational participation, participation in IGAs, cosmopolitanism, environmental awareness, knowledge on flood coping mechanisms and household food security had positive and credit received and utilization of received credit had negative while age, family size, training received, risk orientation and involvement in safety net programmes had no significant relation with coping strategies towards household food security during flood period.

Keywords: Personal characters; food security; coping strategies.

1. INTRODUCTION

Slow onset floods that hit Bangladesh every year, usually last for one or more weeks, or even months that can also be lethal but tend to give people much more time to move to higher ground. During slow-onset floods, when deaths occur they are much more likely to be due to disease, malnutrition or snakebites. These floods are a result of surface water runoff (flash floods are also a result of surface water runoff, but the terrain is a larger factor in the severity of the flood). As this kind of flood last for a long period, less likely to sweep away property, although it can lead to lose of stock, damage to agricultural products, roads and rail links. Human personality is the most complex and fascinating phenomenon studied by many scientists. There are many interrelated and constituent attributes that characterize an individual and form an integral part in the development of their personality. It is rightly assumed that an individual's characteristic patterns to a considerable extent determine the attitude and influence in decision- making relating to almost every behavioural manifestation in life and even in coping towards all kinds of natural calamities. It becomes, therefore, very essential to describe some of these individual characteristics which may enable one in understanding and prediction human behaviour with reasonable degree of accuracy. The present study will give much emphasis on focusing the household food security of the farm families who are actually subsistence farmers and vulnerable to various natural calamities especially flood. This is because under the burden of chronic poverty, this category of people may use their natural environment in unsustainable ways, leading to further deterioration of their livelihood conditions [1]. This study is an attempt to investigate the facts and factors of food insecurity for the people of Bangladesh who are dwelling in riverine areas and are regularly affected by a slow on set flood of merely 30 days, with a view to facilitating the policy makers to take timely and viable steps and

workable strategies for addressing the food insecurity problem in consonance with the National Food Policy (NFP).

2. METHODOLOGY

The study was carried out at flood affected riverine villages of three upazilas under Jamalpur district in Bangladesh during September, 2011 to May, 2012 to explore the relationship, contribution and direct-indirect effect between personal attributes and their coping strategies towards household food security practiced by the farmers during flood. Data were collected from randomly selected respondents through both the qualitative and quantitative techniques and analyzed with the help of SSPS. Eighteen personal, economic, social and psychological characteristics of the farmers that are considered as independent variables were age, personal education, family size, water and sanitation condition, annual income, annual expenditure, savings, credit received, utilization of credit, training experience, organizational participation, participation in income generating activities, cosmopolitanism, risk orientation, environmental awareness, knowledge on flood coping mechanisms, year round household food situation and involvement in safety net programmes were the independent variables of the study. The selection of independent variables was made on the basis of expert opinion, peer group discussion, literature related and also consultation with learned supervisors, that seems like better matching relationship with the dependent variable. Descriptive statistics e.g. range, mean and standard deviation have been presented and the mean value under each variable was compared through computation of 'Duncan's Multiple Range Test' (DMRT). Chi-square test was also completed to explore the relationship among the variables. Pearson Product Moment Correlation Coefficient (r) was used to determine the linear relationship among the variables.

3. RESULTS AND DISCUSSIONS

3.1 Characteristics of the Farmers

3.1.1 Age

The age of the respondent farmers ranged from 23 to 75, representing the very young progressing through middle age to the most elderly segment of the farming community, with a mean of 43.70 and standard deviation of 9.50, respectively. Similar wider range of population age was observed by Islam [2]. The chi-square value (3.91) also showed non-significant. However, as whole majorities (77.1 percent) of them were belonging under young and middle aged category. Similar findings were found Roy [3]. The farmers having young to middle aged are generally more energetic and innovative.

3.1.2 Personal education

The level of education of respondents ranged from 0-15 with a mean of 3.28 and standard deviation of 4.23. The chi-square value was 41.05 and it meant that the relationship between different categories of farmers and their level of education was highly significant. The combined education of primary, secondary and above secondary level constituted 39.6 percent of all category distribution of the respondents that are seems to very much lower than national average of Bangladesh 46.15 percent [4]. Akanda [5] found that majority (48 percent) of the respondents had low to no education.

3.1.3 Family size

The maximum family size scores of the respondent was 13 and minimum was 2 with a mean and standard deviation of 5.16 and 1.73 respectively. The chi-square value was found highly significant (15.95) meaning that there was a significant relationship between the different categories of farmers and their family size. In this study, an overwhelming majority (91.3 percent) of the farmers had small to medium family size category. This finding has similarity with the studies of Islam [2]. It was indicated that proportion of nuclear family increased with increase in poverty. After marriage guardians of the family decided to separate other earning members for avoiding economic crisis and other intra family conflicts. This is why as exception nuclear family is also observed in the char area.

3.1.4 Water and sanitation condition

The water and sanitation condition of the respondent farmers ranged from 3 to 18, with a mean of 10.62 and standard deviation of 2.64. The calculated chi-square value (8.333) was not significant meaning that there was no relationship between the different categories of farmers and water and sanitation condition. The finding has similarity with the studies of Farhad [6] that the majority (95 percent) of the farmers maintained high to medium housing status where ownership, type, water supply, sanitation facilities and drainage system of the house was counted as indicators.

3.1.5 Annual income

The annual income of the respondents score ranged from 5-440 thousand taka with a mean of 115.03 and a standard deviation of 70.09. The estimated chi-square value (117.17) also found highly significant which pointed that there had a relationship between farmer categories and their family income. Data indicated that more than half (53.0 percent) of the farmers had medium annual income while a little below one fourth (21.8 percent) of them had high to very high income and one fourth of them (25.3 percent) had low income. Mahzabin [7] found 67.3 percent of respondents had medium annual income group in her study on household food security status of selected farmers. High income help farmers through providing risk bearing ability and ability to invest more in coping strategies regarding food security during flood period.

3.1.6 Annual expenditure

The annual expenditure scores of the farmer varied from 6-576 thousand taka with a mean and standard deviation of 107.61 and 64.83, respectively. The mean value depicted a significant difference among farmer categories. The estimated chi-square value (99.75) also found highly significant which pointed that there was a relationship between farmer categories and their family expenditure. From the data as most of the farmers of the study area had medium annual income, the annual expenditure was in conformity with the income. Mahzabin [7] found in her study that 60.6 percent had medium, 34.6 percent high and 4.8 percent were low annual expenditure.

3.1.7 Savings

The saving scores of the farmer ranged from taka 0 to 195 with a mean and standard deviation

of 11.40 and 18.88, respectively. The result of chi-square (18.88) shows that a significant positive relationship exists between the savings and different categories of farmers which imply that, there is a variation among different categories of farmers in terms of their savings. An overwhelming majority (84.5 percent) of the respondents were low saver compared to negligible proportion (11.9 percent) were medium saver and very negligible proportion (2.7 and 0.9 percent) were high and very high saver, respectively. The result is similar to the findings of Roy [3] that 96.2, 64.36 and 96.7 percentage of respondents were no to low savings respectively. The result indicates that they had less scope to cope with the vulnerable situation by using their savings.

3.1.8 Received credit

Received credit score of the farmers ranged from 0 to 300 with a mean and standard deviation of 14.44 and 29.73, respectively. The mean received credit scores of marginal, small and medium farmers were 11.91, 15.04 and 14.77, respectively. The computed chi-square value (4.57) was found statistically insignificant which indicates that, there was no relationship among different categories of farmers and their received credits. Considering all three categories of farmer together, half (48.4 percent) of them had different levels of access to credit. It is due to the credit programmes of the NGOs and banks but remarkable is that still now more than one tenth of them go to *Mohajon* for loan where interest is so high. Roy [3] found 90.4, 65.82 and 68.3 percent of respondents had received no to low credit in their studies respectively.

3.1.9 Utilization of credit

Utilization of credit score of the farmers ranged from 0 to 100 with a mean and standard deviation of 40.95 and 44.03, respectively. The computed chi-square value (9.90) was found statistically insignificant which indicates that, there was no relationship among different categories of farmers and their credit utilization. Credit use discrimination among farmer categories such as marginal, small and medium did not show any deviated trend. Similar findings were observed in the studies of Akanda [5].

3.1.10 Training experience

Farmers' training experiences ranged from 0-24 with a mean of 1.46 and standard deviation of

4.30. The mean value of training experience depicted a significant difference among three farmer categories. The computed chi-square value (25.80) also found highly significant which meant that there was a relationship between farmer categories and their training experience. In all categories of farmers 77.1 percent did not have any training experience. Al-Amin [8] found majority of char women (79.5 percent) did not get any opportunity to receive any training and near about one-fifths (18.5 percent) had short training experience.

3.1.11 Organizational participation

The organizational participation scores of the farmers ranged from 0 to 92 with a mean and standard deviation of 11.42 and 18.17, respectively. The chi-square value (44.36) was found to be significant which means that there is a relationship between different categories of farmers and their organizational participation. More than one thirds of farmers (39.3 percent) did not any organizational participation while 46.7 percent of the farmers had low, 8.0 percent medium and only 6.0 percent had high participation. Similar factual evidence of farmers' had no organizational participation has been documented in earlier studies done by Islam [2] (56.67 percent) and Haque [9] (66.19 percent). In all categories of farmers 86.00 percent of farmers had no to low organizational participation.

3.1.12 Income generating activities

The computed income generating activities score of the farmers ranged from 0 to 26 with a mean and standard deviation of 17.21 and 4.05, respectively. The computed chi-square value (46.94) was found statistically significant. In this study, highest proportion (75.3 percent) of the farmers fall in the medium income generating activities category compared to 18.8 percent under high, 5.7 percent in low and only 0.3 percent in no income generating activities. Roy (2014) observed 99.7 percent of respondents had operated low to medium income generating activities. From the findings, it is evident that, medium farmers had higher mean income generating activities scores which implied that medium farmers are more responsive to income generating activities than their marginal and small farmer counterparts. From the study it has been observed that majority (57.50 percent) of income generating activities were with crop production, 14.84 percent with vegetable and tree production, 19.56 percent with livestock

production, 1.02 percent with fish culture and 7.07 percent with non agricultural activities.

3.1.13 Cosmopolitaness

The cosmopolitaness scores of the farmers ranged from 0 to 15 with a mean and standard deviation of 5.41 and 3.45, respectively. The computed chi-square value (9.59) was found significant indicating that there is a relationship among different categories of farmers with respect to their degree of cosmopolitaness. In this study more than half (52.1 percent) of the farmers having low cosmopolitaness compared to 42.9 percent medium and only 5.1 percent had high cosmopolitaness. The findings had similarity with the findings of Al-Amin [8] that majority of the respondents were under low cosmopolitaness category.

3.1.14 Risk orientation

The risk orientation scores of the farmers ranged from 20 to 30 against the possible score of 10 to 30 with a mean and standard deviation of 28.11 and 1.69, respectively. The chi-square value (1.46) did not show statistically significant. Majority (93.2 percent) of the respondents had high risk orientation compared to 6.5 percent had medium risk and a few only 0.3 percent had low risk orientation. Higher risk oriented farmers (more than 90 percent) have the ability to combat the risk by using proper practices. Though the results were dissimilar with the results of Roy [3] that they found low risk oriented farmers were 17.60 and 10.4 percent in their concerned studies respectively but these assertive attitude indicated the sampled people had preparedness for the coming flood distortion.

3.1.15 Environmental awareness

The environmental awareness score of the farmers ranged from 25-40 with a mean and a standard deviation of 35.69 and 2.24 respectively. The computed chi-square value (9.031) was however found significant which indicates that there is a relationship among different categories of farmers and their level of environmental awareness. Majority (97.3 percent) of all the farmers had high environmental awareness and only 2.7 percent of them had medium awareness. Islam [2] found the majority of the FFS (90 percent) farmers had high environmental awareness. The rationale of such high environment awareness belongs to

farmer's innate tendency to conserve this environment conducive to meet the demand of the day and to meet the demand of the day to come, as well.

3.1.16 Knowledge on flood coping mechanisms

Knowledge on flood coping mechanisms score of the farmers ranged from 11 to 56 against the possible range of 0 to 56 with a mean and standard deviation of 39.05 and 10.73, respectively. The estimated chi-square value (15.38) was found statistically significant. The result is contrary with the result of Islam [2] that majority (94.90 percent) of the farmers had low to medium knowledge on agrochemicals use. But Haque [9] found 65.20, 77.90, 59.15 and 71.90 percent respectively that the farmers had low to medium knowledge on their respective study.

3.1.17 Year round household food situation

Year round household food situation ranged from 12-36 with a mean of 28.90 and standard deviation of 3.78, respectively. The mean value depicted a significant difference among farmer categories with respect to their household food security. The computed chi-square value (32.140) also showed highly significant. Data indicates that a majority (59.82 percent) of the farmers could affirm their medium food security status leaving 27.68 percent high and more than one tenth (12.50 percent) of low food security status. The result is slightly differ from the results of Haque [9] that majority percent of farmers could affirm their high (58.57 percent), 37.14 percent medium and 4.29 percent low food security status.

3.1.18 Involvement in safety net programmes

The involvement in safety net programmes by the respondent farmers ranged from 0 to 25, with a mean of 3.37 and standard deviation of 4.46. No significant mean difference was found among farmers categories. The chi-square value (4.35) also showed non-significant. An overwhelming majority of (92.6 percent) of farmers had low safety net recipient followed by only 6.5 percent had medium safety net recipient and an uncountable number (only 0.9 percent) had high safety net recipient. HISAL [10] in their survey found that about 20 percent of respondents had access to different safety net programmes in *haor* area Kishoreganj district.

Table 1. Range, mean and standard deviation of different characteristics

Characteristics	Percentage distribution of farmers			
	Range	Mean	SD	Chi-square (χ^2)
1. Age	23-75	43.70	9.50	3.91, P < 0.417 = NS
2. Personal education	.00-15.00	3.28	4.23	41.05, P < 0.000 = HS
3. Family size	2-13	5.16	1.73	15.95, P < 0.003 = HS
4 Water and sanitation condition	3-18	10.62	2.64	8.333, P < 0.080 = NS
5. Annual income	5-440	115.03	70.09	117.17, P < 0.000 = HS
6. Annual expenditure	6-576	107.61	64.83	99.75, P < 0.000 = HS
7. Savings	0-195	11.40	18.88	18.88, P < 0.004 = HS
8. Credit received	0-300	14.44	29.73	4.57, P < 0.60 = NS
9. Utilization of credit	0-100	40.95	44.03	9.90, P < 0.129 = NS
10. Training experience	0-24	1.46	4.30	25.80, P < 0.000 = HS
11. Organizational participation	0-92	11.42	18.17	44.36, P < 0.000 = HS
12. Participation in income generating activities	0-26	17.21	4.05	46.94, P < 0.000 = HS
13. Cosmopolitaness	0-15	5.41	3.45	9.59, P < 0.048 = S
14. Risk orientation	20-30	28.11	1.69	1.46, P < 0.834 = NS
15. Environmental awareness	25-40	35.69	2.24	9.031, P < 0.011 = HS
16. Knowledge on flood coping mechanism	11-56	39.05	10.73	15.38, P < 0.004 = HS
17. Year round household food situation	15-36	28.90	3.78	32.140, P < 0.000 = HS
18. Involvement in safety net programme	0-25	3.77	4.46	4.35, P < 0.361 = NS

*NS=Non significant, S Significant and HS=Highly significant

Table 2. Correlation between independent and dependent variables (N=336)

Dependent variable	Independent variables	Correlation coefficient (r)
Coping strategies towards household food security during flood period	1. Age	0.41
		0.054
	2. Personal education	0.184**
	3. Family size	0-.036
	4. Water and sanitation condition	0.267**
	5. Annual income	0.242**
	6. Annual expenditure	0.186**
	7. Savings	0.191**
	8. Credit received	-0.171**
	9. Utilization of received credit	-0.241**
	10. Training Experience	0.002
	11. Organizational participation	0.123*
	12. Participation in IGA	0.448**
	13. Cosmopolitaness	0.320**
	14. Risk orientation	-0.093
	15. Environmental awareness	0.220**
	16. Knowledge on flood coping mechanism	0.424**
	17. Year round household food situation	0.198**
18. Involvement in safety net programme	-0.017	

** Significant at 0.01 level, * significant at 0.05 level

3.2 Relationship between the Selected Characteristics and Household Food Security

The coping strategies towards household food security during flood period had significantly

positive relation with 11 factors (independent variables) such as: personal education (0.184**), water and sanitation condition (0.267**), annual income (0.242**), annual expenditure (0.186**), savings (0.191**), organizational participation (0.123*), participation in income generating

activities (0.448**), cosmopolitaness (0.320**), environmental awareness (0.220**), knowledge on flood coping mechanism (0.424**) and year round household food security (0.198**). On the other hand, two factors (independent variables) like credit received (-0.171**) and utilization of received credit (-0.241**) had significantly negative relationship with coping strategies towards household food security during flood period (Table 2).

The correlation coefficient was significant in case of the above 13 independent variables and coping strategies towards household food security during flood period while the rest five other factors was insignificant. Based on the computed 'r' value, the concerned null hypothesis was rejected for the above mentioned significant (positive and negative) characteristics and accepted in case of age (0.054), family size (-0.036), training experience (0.002), risk orientation (-0.093) and involvement in safety net programme (-0.017).

4. CONCLUSION

The researcher collected several related literatures and selected only 18 relevant characteristics that would be played a vital role for coping strategies towards household food security. But five variables (age, family size, training experience, risk orientation and involvement in safety net programme) showed non significant relation might be due to locality, respondents of the study area, their socio-economic condition, previous experience on disaster, severity of flood damage.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the authors.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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