

## **SOCIO-ECONOMIC DETERMINANTS OF OFF-FARM ACTIVITY PARTICIPATION IN BANGLADESH**

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### **ABSTRACT**

The study was conducted in two districts of Bangladesh to determine the factors affecting the participation in off-farm activity. A total of 150 sample farmers were selected for interview through random sampling technique. The results showed that the average annual income was higher for service holders (Tk.1,83,696) compared to business (Tk. 1,69,215) and off-farm labour activities (Tk.1,09,373). Participations in activities like business and services were positively influenced by the farm size and education respectively. On the other hand, farm size and education were inversely related with participation in off-farm labour activities. Farmers in the study areas mentioned low income from agriculture as a reason for participating in off-farm activity.

### **KEY WORDS**

Household income; Off-farm income; Service; Off-farm labour; Determinants.

Due to economic pressure, many households often search for alternative means like off-farm activities to cope with the problem of income variability. Off-farm activities have become an important component of livelihood strategies among rural households in our country. Several studies have reported a substantial and increasing share of off-farm income in total household income (Haggblade *et al*, 2007). The role of off-farm activities in promoting growth of rural economy and reducing poverty is well documented (Child and Kaneda, 1975; Islam, 1984; Ranis and Stewart, 1993; Reardon, 1997; Weijland, 1999; Lanjouw, 2001). Rural off-farm sector encompasses generally all non crop activities that are not directly related to crop and non crop production operations but are carried out as backward-forward linkages to the various enterprises within the rural areas proper and also in the small urban and peri urban areas of large metropolitan (Mandal, 2002).

Diversifying one's sources of income has become a major challenge in Bangladesh in recent years. Compared to the agricultural sector, employment opportunities in the off-farm sector have been increasing rapidly since the early nineties (The Financial Express, 2012). The Government of Bangladesh in its national poverty reduction strategy paper identified the off-farm sector as a "leading sector" in the rural economy (GOB, 2005). There are several studies (Islam, 1984; Hossain *et al*, 1994; Bhattacharya, 1996; Khandker, 1996; Hossain, 2005) reviewed the off-farm sector in Bangladesh. The purpose of this paper is to provide additional information on off-farm activity in rural areas of Bangladesh for assessing the recent status of off-farm activity. Keeping these factors in consideration the present study was undertaken with the following specific objectives.

Specific Objectives:

1. To examine the structure of rural household incomes in the study areas;
2. To find out factors affecting household participation in off-farm activities; and
3. To find out the reasons for participating in off-farm activities.

### **METHODOLOGY**

The study was conducted in two districts namely Jessore and Rangpur due to high concentration of off-farm activities. Rural off-farm activities in the study areas were classified into three categories; i) Business enterprises such as shop keeping, petty trading, contractor services etc; ii) Services such as salaried service in public and private sector institutions, teachers, lawyer, village doctors etc and iii) Off-farm labour such as mechanics, wage employment in rural business, transport operations, construction labour etc. A total of 150

samples taking 25 from each group and 75 from each district were selected randomly for this study. The study was mainly based on primary data collected through face to face interview during the month of March to May, 2011. The collected data were then edited and processed to fulfill the objectives of the study.

**Analytical technique.** Descriptive statistics were used to analyze the annual household income of the sample farmers. The probit model was used to identify the factors influencing the participation in off-farm activities; a binary choice model based on the method of maximum likelihood is specified. The dependent variable of these models was participation in off-farm activities. Since the dependent variable was dichotomous, OLS cannot be used. Therefore, the following type of probit model was used for this study.

$$Y_i^* = \beta X_i + u_i, \text{ where } u_i \sim N(0, 1), i = 1, \dots, n$$

$$Y = 1_{\{Y^* > 0\}} = 1 \text{ if } Y^* > 0 \\ 0 \text{ Otherwise}$$

Where,  $Y_i$  = Farmers participating in the off-farm activities (if participate = 1; other wise = 0),  $X_i$  = Independent variables. Three separate models for this purpose were run for three categories of off-farm activity like (i) Business activities (ii) Services, and (iii) Off-farm labour.

**Variable used in the probit model and their measurement:**

Age ( $X_1$ ): Respondent's age in year was directly inserted in the model. This variable could have a positive or negative effect on the respondent's decision to participate in the off-farm activities.

Farm size ( $X_2$ ): Farm size is an indicator of social status of the respondents. It was calculated on per hectare basis for each respondent.

Household workers ( $X_3$ ): It was measured on the basis of number of earning members in the family.

Dependency ratio ( $X_4$ ): It is the ratio of total number of family members and earning members of the family.

Organizational participation ( $X_5$ ): It was measured on basis of participation in the different organization. A respondent was given a score of one if he is a member of any organization, otherwise 0.

Infrastructure development ( $X_6$ ): In this study development of road and highways was considered as a proxy of infrastructure development. A score of 1 is given if the respondents have the facilities to use the roads and highways, otherwise 0.

Education ( $X_7$ ): Education of the respondent was measured on the basis of total schooling years.

## RESULTS AND DISCUSSION

**Average annual income of the respondents.** Average annual income was found higher for service holders (Tk. 183696) than that of business (Tk. 169215) and off-farm labour (Tk. 109373). Among the service holders higher income was found for the respondents of Rangpur compared to Jessore. Out of the total income, highest portion of the income comes from off-farm income activities compared to agricultural income for all categories of respondents. Service holders of Jessore received highest 68% of their total income from off-farm activities compared to the service holders of Rangpur (see Table 1).

**Factors affecting participation in off-farm activities.** The parameters of the Probit model estimated to identify the factor influencing participation in off-farm activities are presented in Table 2, 3 and 4.

The intensity of participation in business activities is positively related with farm size, organization participation and infrastructure development. If the farm size increases by 1%, keeping other factors constant, the probability of participating in business activities would increase by 0.60%. This may be for the fact that if farm size increases respondents may earn more money by producing more crops in the field. As a result they can invest this extra money in their business activities. Similarly, if the respondents can avail developed

infrastructure like road and highways they can easily communicate with other areas and increase their volume of business (see Table 2).

Table 1. Average annual income of different categories of respondents

Sources	Business			Service			Off-farm		
	J	R	All	J	R	All	J	R	All
A. Agricultural income (Tk)									
Crop sector	54162	77943	66052	40997	76962	58980	36132	41213	38672
Livestock	9605	9988	9796	4620	11596	8108	10795	8991	9893
Poultry	665	428	547	596	304	450	852	490	671
Fisheries	1260	3140	2200	1060	1280	1170	800	600	700
Others	3880	-	1940	8780	980	4880	1600	28	814
Sub Total	69572 (50)	91499 (46)	80535 (48)	56053 (32)	91122 (47)	73588 (40)	50179 (45)	51322 (47)	50750 (46)
B. Off-farm income (Tk)									
Business	68880	108480	88680	-	-	-	-	-	-
Service	-	-	-	118248	101969	110108	-	-	-
Off-farm labour	-	-	-	-	-	-	60222	57024	58623
Sub Total	68880 (50)	108480 (54)	88680 (52)	118248 (68)	101969 (53)	110108 (60)	60222 (55)	57024 (53)	58623 (54)
Grand total (A+B)	138452 (100)	199979 (100)	169215 (100)	174301 (100)	193091 (100)	183696 (100)	110401 (100)	108346 (100)	109373 (100)

Note: J= Jessore, R= Rangpur, Figures in the parentheses indicates percentage of grand total

Table 2. Factors affecting participation in business activities: estimates of a probit model

Factors	Coefficients	Standard error	z-value	Marginal effect
Education	0.004	0.03	0.17	0.0016
Age	0.004	0.01	0.37	0.0014
Farm size	0.601**	0.23	2.50	0.2027**
Household workers	0.004	0.11	0.03	0.0013
Dependency ratio	0.19	0.14	1.53	0.0652
Organizational participation	0.75**	0.27	2.92	0.2401***
Infrastructure development	1.27***	0.35	3.71	0.3392***
Constant	-1.93**	0.85	-2.39	-
Log likelihood function			-75.16	
LR chi2			40.62	
Prod>chi2			0.000	
Pseudo R <sup>2</sup>			0.21	
Observations (n)			150	

In the case of service, education plays a positive and significant role. The respondents having higher education are encouraged to participate in services. If the education is increased by 1%, keeping other factors constant, the probability of participation in services would increase by 0.20%. Dependency ratio also positively associated with the participation in services. On the other hand, organizational participation is negatively related with services due to the fact that organizational participation requires additional time which restricts the service holders to take part in this kind of activity (see Table 3).

Most of the factors included in the model are negatively associated with the participation in off-farm labour activities. The negative association with age indicates the preference of the younger generation for off-farm jobs over agricultural wage labour. Negative association with farm size indicates that if the respondents have more land they can produce more crop and earn money from selling this crops. Organizational participation and infrastructure development were also negatively associated with off-farm labour activities. Negative association of education indicates educated persons are more comfortable with service sector compared to off-farm labour activities (see Table 4).

Table 3. Factors affecting participation in different services: estimates of a probit model

Factors	Coefficients	Standard error	z-value	Marginal effect
Education	0.207***	0.04	5.72	0.0704***
Age	0.005	0.01	0.50	0.0020
Farm size	-0.150	0.23	-0.68	-0.0513
Household workers	0.148	0.15	1.13	0.0504
Dependency ratio	0.288**	0.14	2.32	0.0981**
Organizational participation	-0.419*	0.27	-1.63	-0.145*
Infrastructure development	-0.386	0.29	-1.38	-0.136
Constant	-2.90***	0.77	-3.55	-
Log likelihood function			-69.40	
LR chi2			52.15	
Prod>chi2			0.000	
Pseudo R <sup>2</sup>			0.27	
Observations (n)			150	

Table 4. Factors affecting participation in off-farm labour activities: estimates of a probit model

Factors	Coefficients	Standard error	z-value	Marginal effect
Education	-0.23***	0.04	-5.49	-0.060***
Age	-0.22*	0.01	-1.60	-0.005*
Farm size	-1.43**	0.61	-2.34	-0.374**
Household workers	0.18	0.15	1.14	0.047
Dependency ratio	0.21	0.15	1.41	0.055
Organizational participation	-0.33	0.29	-1.12	-0.088
Infrastructure development	-0.93**	0.35	-2.64	-0.284**
Constant	4.40***	1.10	4.05	-
Log likelihood function			-52.61	
LR chi2			88.03	
Prod>chi2			0.000	
Pseudo R <sup>2</sup>			0.46	
Observations (n)			150	

**Reasons of participation.** According to the Table 5 the majority of the respondents (79%) mentioned that low income from agriculture is the major reason for participating in off-farm activity in the study areas. Burden of maintaining large family was ranked second most important reason for participating in off-farm activity followed by availability of off-farm work opportunity.

Table 5. Reasons for participating in off-farm activities

Reasons	% of farmers		
	Jessore	Rangpur	All areas
Burden of large family	80	77	77
Low income from agriculture	76	83	79
Available opportunities	67	53	60

## CONCLUSION

The findings of the study reveal that on an average service holders received higher annual income compared to other categories of respondents. Farm size, infrastructure development and education had significant contribution in promoting off-farm activities like business and service whereas these factors are inversely related with off-farm labour activities. Low income and large family were the reasons for participating in off-farm activities in the study areas. Government and concerned authority should provide efficient support services to the farmers and build roads and highway to ensure participation in off-farm activities. By promoting this sector, farmers will be able to get sufficient amount of income which in turn may be used for investment in the farm practices. Off-farm activities may be used as a means of income diversification which will help to reduce poverty and boost the rural economy as a whole.

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