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**PATTERN AND LEVEL OF ON-FARM AND OFF-FARM  
EMPLOYMENT OF FARM HOUSEHOLDS: EVIDENCES FROM AN  
AREA OF GAIBANDHA DISTRICT**

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**ABSTRACT**

In Bangladesh the labour absorption capacity of agriculture has declined because of population pressure, land distribution structure, increasing application of labour saving farm technologies, etc. As a result, the off-farm sector in the country has attracted attention in recent years as it has performed an increasingly significant rural income augmentation function. In the study area rural males utilized about 29 and 66 percent mandays on on-farm and off-farm activities and rural females utilized 17 and 42 percent women days on on-farm and off-farm activities respectively. Family size, educational level, higher family income and use of farm machinery were positively and farm size was negatively related to off-farm employment. For Bangladesh rural areas with acute employment and under employment, increased efforts should be made to create off-farm employment opportunities.

**I. INTRODUCTION**

Bangladesh with a population of 13.5 million ranks ninth place in the world. About 80.37 percent of this population is living in rural areas having a very low per capita income of US\$ 369. Among rural people over 50 percent live below poverty line and roughly 40 percent live under condition of absolute poverty (BBS-1999). Employment is considered to be the most pressing of all problems in Bangladesh. The Government of Bangladesh recognized the need for developing appropriate strategies and policies for generating rural employment with the objective of providing full employment or at the least narrowing down acute unemployment obtaining in rural areas. In order to generate employment, Bangladesh cannot exercise the option in favour of the traditional process of creating labour surplus in the farm sector. Consequently, farm families derive their living from a wide range of both on-farm and offfarm activities.

The agriculture sector underscores the need for alternatives avenues for employment generation in the rural areas. However, it is a crucial task to continue of the ever-growing labour force of the country in agricultural sector because the process of economic development is characterized by a substantial development in the non-farm activities. On the other had, change in consumption pattern of the rural household and the gap between urban and rural income make off-farm job attractive. Gender composition of worker in farm and

off-farm activities has not received adequate attention although there has been an upsurge of interest about female labours in agriculture and a number of studies on female employment in this sector have been conducted. The present study, therefore, focuses on the pattern and level of on-farm and off-farm employment.

#### Objectives:

The objectives of the study are as follows:

1. To identify the socioeconomic status of farm families.
2. To study pattern and level of employment.
3. To explore the determinants of off-farm activities of farm households.

## II. METHODOLOGY

Data required for the study were collected from three villages under Sadar Upazila of Gaibandha District. Data were collected through personal interviews by using structured survey schedule. Twenty-six households were randomly selected from each of the villages. Data were collected during September to October 2001. This paper comprised of two sections. In the first section, the result was given in tabular form to examine the impact of various characteristics of the farm households on the participation of members of the farm households in off-farm activities. In the second section, the same data were used to quantify the contribution of various factors in determining off-farm labour supply through functional approach.

#### Functional Approach

To determine the effects of various factors on off-farm labour supply by farm households log linear regression function, which fitted well, was estimated. The generalized model was of the following form:

$$Y = ax_1^{b_1} x_2^{b_2} x_3^{b_3} x_4^{b_4} x_5^{b_5} x_6^{b_6} x_7^{b_7} x_8^{b_8} e^{U_i}$$

Which in its linear form was specified as:

$$\text{Log } Y = \text{log}a + b_1 \text{log}X_1 + b_2 \text{log}X_2 + b_3 \text{log}X_3 + b_4 \text{log}X_4 + b_5 \text{log}X_5 + b_6 \text{log}X_6 + b_7 \text{log}X_7 + b_8 \text{log}X_8 + U_i$$

Where,

Y= Hours of adult labour supply by farm households for off-farm activities

X<sub>1</sub>= Cash income per household (Tk)

X<sub>2</sub>= Available male labour (number/household)

X<sub>3</sub>= Female labour working on farm and off-farm activities (number/household)

X<sub>4</sub>= Off-farm investment (Tk)

X<sub>5</sub>= Value of farm machinery and farm related equipment (Tk)

X<sub>6</sub>= Average age of farm household adult members (Years)

X<sub>7</sub>= Average years of schooling of farm household members (Years)

X<sub>8</sub>= Average operational holding per household (acres)

U<sub>i</sub>= Error term

b<sub>1</sub>-b<sub>8</sub>= Co-efficient of respective variables.

### III. RESULTS AND DISCUSSIONS

The results obtained from the study were discussed in two sections. In the first section, pattern of employment was identified with respect to status of farmer activities, family size, educational level and income and the level of employment was identified with respect to income, dependency, supply and utilization of labour days for farm and off-farm activities. In the second section, the results of functional approach were discussed.

#### Characteristics of Farm Households

Among the various characteristics family size, age of family members, farm size and educational level indicate mobilizable labour supply. These characteristics of farm household were presented in Table 1. It is observed from the table that average family sizes were 4.73, 5.26, 6.56 and 7.20 for marginal, small, medium and large farm respectively. For all categories of farms it was observed that the highest portions of family members were at the age of working group that is 19-57 years of age group.

Land ownership pattern is an important factor affecting the mobilization of rural labour force to on-farm and off-farm activities. Table 1 indicates that distribution of land in the study area is very skewed. Most of the land is owned by a few landowners. So the marginal and small farmers were very much dependent on off-farm activities though sharecropping was common in the villages.

Educational status helps in understanding environmental conditions and adjusts the livelihood of people according to their requirements of the time in the light of available resources. It makes a man more capable to manage resources and hence to earn maximum profit. It also plays a role in managing business of farm as well as out of farm. Table 1 showed that educational level of large farm was higher and for marginal farm it was very low. The rates of pre-school children are more or less equal for all types of farms. But the percentage of people having primary level education of medium farm was higher than that of small or marginal farm households. The percentage rate of secondary, higher secondary and above secondary level education had positive relationship with farm size because of the higher resource base of large farm households.

**Table 1: Characteristics of farm household**

Particulars	Marginal	Small	Medium	Large
No. of farm	15	42	16	5
Family size	4.73	5.26	6.56	7.2
Ag. distribution of members:				
Up to 6 Years (%)	20.27	15.38	8.49	8.33
7-18 Years (%)	22.97	33.03	31.13	22.22
19-57 Years (%)	56.76	47.06	47.17	61.12
Above -57 Years (%)	-	4.53	13.21	8.33
Farm size (acres)	0.021	0.630	3.12	9.47
Educational level: (in %) Illiterate	56.34	36.18	15.10	2.77
Pre-School	7.04	9.95	9.93	8.33
Class -I-V	29.57	29.41	35.85	8.33
Class-VI-X	5.63	17.18	21.70	30.55
S.S.C	-	4.98	11.32	16.66
H.S.C	1.41	1.80	4.72	22.22
Above - H.S.C	-	0.50	1.88	11.14

Source: Field survey, 2001

### **Pattern of Employment of Farm Households According to Status**

To identify the pattern of employment the members of the sample farm households were distributed into two groups, namely working group and non-working group. Working group includes the members doing farm activities, multiple activities (on-farm+off-farm), off-farm activities and domestic work. Non-working group, however, comprised of unemployed and inactive persons. The data presented in Table 2 indicate that about 56.9, 72.5, 52.4 and 55.2 percent of the members of marginal, small, medium and large farm households belonged to working group whereas 43.1, 27.5, 47.6 and 44.8 percent households were in non-working group. The proportion of the members of the medium farm households involved in farm work was high (15.9 percent) and the highest proportion (35.5 percent) of the members of marginal farm households was involved in off-farm activities. The involvement of large farm households' members in multiple works was high (28.9 percent). On the other hand, the proportion of the member of medium farms was high in non-working groups (47.6 percent).

**Table 2: Pattern of employment of farm households according to status**

Item	(Percentage)				
	Marginal	Small	Medium	Large	All
Working group	56.9	72.5	52.4	55.2	64.9
Farm activity	-	5.8	15.9	2.6	6.8
Multiple activity	2.0	14.0	4.7	28.9	10.7
Off-farm activity	35.5	28.1	10.3	7.9	25.0
Domestic work	19.4	24.6	21.5	15.8	22.4
Non-working group	43.1	27.5	47.6	44.8	35.1
Student	20.3	2.9	27.1	28.9	13.3
Unemployed	2.8	3.5	7.5	2.6	2.8
Inactive	11.1	8.2	3.7	7.9	7.8
Children	9.6	12.9	9.3	5.4	11.2
Total	100.0	100.0	100.0	100.0	100.0

Source: Field survey, 2001

Thus it is observed from Table 2 that having little opportunity to work on own farms, marginal and small farms were mostly dependent on off-farm work. The large farms were dependent on multiple works due to possession of more land and capital while medium farms were dependent on farm work due to having some opportunities for farm work. It appears from the table that off-farm employment is negatively related with farm size in the present study.

### **Pattern of Off-farm Employment by Various Activities**

Farm household members were found performing off-farm jobs like farm labour, casual non-farm labour, government service, private service or NGO jobs, business and others. Table 3 reveals that the proportion of the marginal farm households involved in off-farm job was the highest (37 percent) in terms of farm labour followed by casual non-farm labour (17.2 percent), private service or NGO's (3.7 percent), government service (3.7 percent), business (20.4 percent) and others (18.0 percent). The small farm households were involved in all types

of off-farm work in general. The medium households were more involved in business (49.9 percent) relative to casual non-farm labour (8.0 percent), private service or NGOs (10.5 percent), government service (15.8 percent) and others (10.5 percent) during the year. The proportion of the members of large farm households was found to have been engaged mostly in business (60.2 percent) followed by Government service (30.8 percent) relative to that of marginal, small and medium farms. This could be attributable to their participation in armed forces and other jobs which required education up to middle level. The relatively sound position of large farm households enabled them to be ahead of other households in adopting business.

**Table 3 : Distribution of earning labour force belonged to farm households by various off-farm activities**

Type of Activities	(Percentage)				
	Marginal	Small	Medium	Large	All
Farm Labour	37.0	16.2	3.3	-	16.5
Casual non-farm labour	17.2	15.5	8.0	-	13.3
Private service/NGOs	3.7	14.7	10.5	9.0	11.4
Govt. Service	3.7	13.2	15.5	30.8	13.0
Business	20.4	28.2	49.9	60.2	33.6
Others	18.0	12.2	10.5	-	12.2
Total	100.0	100.0	100.0	100.0	100.0

Source: Field survey, 2001

### Pattern of Employment by Family size

Some ancestral traditions in vogue to maintain operational holding as a symbol of prestige in rural areas inherited to farm families inhibit adoption of off-farm jobs by these types of families. However, changes in socioeconomic condition have led most of such families especially with large family size to come out of this cage of traditions. Table 4 shows that the family size was positively related with off-farm job, while such relation was negative in the case of on-farm job. This reflects that the large farm households having large family size had surplus labour to participate in off-farm activities.

**Table 4: Distribution of labour force of farm households into various jobs by family size**

Family Size	(Percentage)		
	Pure on-farm job	Multiple job	Off-farm job
upto-3	28.6	14.3	57.1
4-5	15.6	23.4	61.0
6-7	14.8	18.4	66.8
8 and above	12.9	19.0	68.1

Source: Field survey, 2001

### Pattern of Employment by Education

The educational status is one of the factors determining the quality of labour force. So the pattern of employment differs with educational status. It is observed from Table 5 that the participation of earning labour force of farm household in off-farm jobs was positively related with the educational level. But in the case of illiterate labour, the relationship is also positive.

Table 5 indicates that the involvement of illiterate labourers in off-farm jobs was higher (64.52 percent) than the primary level (60.50 percent) and middle (61.5 percent) level educated groups. Because some off-farm works (rickshaw pulling, carpentry, etc) create prestige elements for the middle class educated group. Again the primary and middle level educated labourers were unable to do what the S.S.C and above educated groups could do. The overall impact of education in general is positive with off-farm job, as members of the farm in performing off-farm jobs followed by S.S.C (68.58 percent) middle (61.5 percent) and primary (60.50 percent) level educated groups.

Table 5 : Distribution of employment by education

Educational level	(Percentage)		
	Pure on-farm job	Multiple job	Off-farm job
Illiterate	17.74	17.74	64.52
Primary (Class IN)	24.50	15.00	60.50
Middle (Class IN)	12.40	26.00	61.60
S.S.C	5.26	26.26	68.58
H.S.C and above	5.10	25.45	70.45

Source: Field survey, 2001

### Pattern of Employment by Various Income Groups

Insufficient farm income against day-to-day requirements of the farm households is one of the factors in influencing the family members to adopt multiple job or pure off-farm jobs. The data presented in Table 6 support the statement, as only 7 percent of the members of the farm households, falling in the lowest income group, was found to be involved with performing multiple (32.7 percent) and off-farm jobs (77.3 percent). Such proportions decreased with the increase in farm income and it reached to the extent of 15.2 percent for the highest income level group. By contrast, the relative proportion of the members of farm households depending upon farm job increased with the increase in income level.

Table 6 : Distribution of earner group of farm households by various income groups  
(Percentage)

Farm income group (Tk./household)	Total	Pure on-farm job	Multiple job	Off-farm job
Up to 20,000	7.0	-	32.7	77.3
20,001-40,000	43.3	7.4	22.1	70.6
40,001-60,000	16.05	30.8	15.4	53.8
60,001-80,000	12.7	30.0	20.0	50.0
80,001-100000	5.2	62.5	-	37.5
Above 100000	15.2	16.7	25.0	58.3

Source: Field survey, 2001

### Level of Income of Farm Households by Farm Size

Farm families derive their income from a wide range of on farm and off-farm sources. The distinction between farm and off-farm income is that farm income includes all incomes

generated by family assets allocated to the farm whereas off-farm income refers to income derived by the households from the work other than that done on own farm. It includes income obtained by supplying services for non-farm work as well as the agricultural work done on farms of other farmers. Table 7 indicates that the average household income of marginal, small, medium and large farms were Tk 27940.67, 34366.43, 122486.67 and 345000.00 per annum respectively. Among total household income, average household net cash incomes of these farms were Tk 25350.67, 27292.14, 91360.67 and 257700.00 respectively. The proportions of farm households receiving income below average were 53.3, 57.1, 68.7 and 80.0 percent for marginal, small, medium and large farms respectively. The data in Table 7 also reflect that off-farm incomes were contributing 95.14, 67.42, 30.26 and 23.48 percent to total cash household income for marginal, small, medium and large farms respectively.

**Table 7: Annual income and share of off-farm income by various farm sizes**

Item	Marginal	Small	Medium	Large	All
Average household cash income (Tk/farm)	27940.67	34366.43	122-1~6.67	345000.0	53426.82
Average household net ash income (Tk/farm)	25350.67	27292.14	91360.67	257700.0	41604.54
Households with cash income below average (%)	53.3	57.1	68.7	80.0	55
Households with cash income above average (%)	46.7	42.9	31.3	20.0	23
Average off-farm income (Tk/farm)	26583.3	23169.0	37066.67	81000.0	30383.52
Off-farm income as % of cash household income	95.14	67.42	30.26	23.48	56.86
Average off-farm net income (Tk/fann)	24136.67	20883.3	31400.0	68300.0	26705.75
Off-farm net income as % of cash household income	95.21	76.52	34.37	26.50	64.20
Average per capita off- farm income	5620.14	4137.32	5295.24	11250.00	5776.33

Source: Field survey, 2001

Off-farm net incomes represented 95.21, 76.52, 34.37 and 26.50 percent of cash household income for marginal, small, medium and large farms respectively. It is also clearly observed that share of off-farm income in both total and net farm incomes were inversely related with the size of farm. because total incomes increase with the increase of farm size implying that total income is positively related with the farm size in rural areas.

#### **Level of Dependency Off-farm employment.**

Agriculture alone cannot provide the employment opportunity to people of a country like Bangladesh where population is rapidly growing. However, change in consumption pattern of the rural households and the gap between urban and rural income make off-farm activities attractive. So, most of the farm families of the rural areas derive their earnings from a wide



range of both farm and off-farm activities. Even some farm households are fully dependent on off-farm activities for their living.

**Table 8: Distribution of household members dependent on farm and off-farm employment by farm size.**

Farm size	Wholly on farm	Wholly on off-farm	On both farm and off-farm
Marginal		91.0	9.0
Small	12.2	58.5	29.3
Medium	51.5	33.3	15.2
Large	6.7	73.3	20.0
All	17.6	62.3	20.0

Source: Field survey, 2001

Table 8 shows that the highest number of members of medium farm are wholly dependent on farm activities relative to marginal (0.0 percent), small (12.2 percent) and large farms (6.7 percent). As expected, the heaviest dependence on off-farm employment was among the landless or marginal households. Ninety one percent of the total earning members of marginal household depend on off-farm activities where small, medium and large households were 58.5, 33.3 and 73.3 percent respectively. The dependency rates of marginal, small, medium and large households on both farm and off-farm activities were 9.0, 29.3, 15.2 and 20.0 percent respectively. Among small and medium households with cultivable land area the extent of dependence on off-farm activities was lower. Rates of participation in off-farm activities were higher on marginal and large farms.

### Level of Supply and Utilization of Labour day

In order to determine the supply and utilization of labour days, the total supply and utilization of farm household for both farm and off-farm activities were distributed into male and female groups., which were shown in Tables 9 and 10.

It is observed from table 9 that the marginal farm size group supplied 527 man-days on an average of which only 32 (6.1 percent) man-days per year were used in different agricultural work and 45 (78.7 percent) man-days were used in off-farm work per year.

**Table 9: Level of supply and utilization of male labour days by farm size.**

Farm size	No. of Farm	Annual labour days supply per farm	Annual labour days utilization per farm		Total labour days utilization per farm	Level of under/over employment
			Farm activities	Off-farm activities		
1	2	3	4	5	6=(4+5)	7=(3-6)
Marginal	15	527 (100)	32 (6.1)	415 (78.7)	447 (84.8)	+80 (15.3)
Small	42	515 (100)	77 (15.3)	380 (75.8)	457 (91.1)	+58 (8.0)
Medium	16	704 (100)	391 (55.6)	283 (42.1)	674 (97.7)	+30 (2.3)
Large	5	723 (100)	550 (76.1)	516 (71.4)	1066 (147.5)	-343 (-47.5)
All	78	569 (100)	163 (28.6)	375 (65.9)	539 (94.7)	30 (5.3)

Source: Field survey, 2001

Figure within the parentheses indicate percentage

The rate of under employment was 15.3 percent. A medium farm supplied 704 man-days per year of which 391 (55.6 percent) man-days were used in agricultural work and 283 (42.1 percent) of man-days were used in off-farm work. The level of under employment was only 2.3 percent. In the case of large farms, utilization of man-days was more than the supplied man-days which indicates the over employment situation. On average 723 man-days were available in a large farm but the utilizations of man-days were 550 for farm and 516 for off-farm work. So the over employment rate was 47.5 percent. For all categories of farms 569 man-days were supplied per farm per year of which 28.6 and 65.9 percent were used in farm and off-farm work and under employment rate was 5.3 percent.

Table 10 indicates that a marginal farm household supplied 117 women-days per year of which 10 (8.5) percent women days were used in farm work and 42 (36 percent) women days were used in off-farm work and the level of underemployment was 55.5 percent. A small farm household supplied 99 women-days per year of which 13 (13.1 percent) women-days were used in farm work and 35 (35.4 percent) women-days were used off-farm work.

The rate of underemployment of small farm was 51.5 percent. Again a medium farm household supplied 40 women-days per year of which 10 (25 percent) women-days were used for farm work and no women worked in off-farm activities.

**Table 10: Level of supply and utilization of female labour days by farm size**

Farm size	No. of Farm	Annual labour days supply per farm	Annual labour days utilization <sup>P</sup> per farm		Total labour days utilization per farm	Level of under/over employment
			Farm activities	Off-farm activities		
1	2	3	4	5	6=(4+5)	7=(3-6)
Marginal	15	117 (100)	10 (8.5)	42 (36.0)	52 (44.5)	+65 (55.5)
Small	42	99 (100)	13 (13.1)	35 (35.4)	48 (48.5)	+51 (51.5)
Medium	16	40 (100)	10 (25)	-	10 (25)	+30 (75)
Large	5	225 (100)	94 (41.8)	224 (99.5)	318 (141.3)	-94 (-41.8)
All	78	98 (100)	17 (17.3)	41 (41.8)	58 (49.1)	40 (40.9)

Source: Field survey, 2001

Figure within the parentheses indicate percentage

The level of underemployment was 75 percent. In the case of large farm, supplied women-days were lower than utilization. Hence the level of over employment on large farms was 41.8 percent. For all categories of farms 98 women-days supplied per farm per year of which 17.3 and 41.8 percent were used in farm and off-farm work and unemployment rate was 40.9 percent.

From the above discussion it is observed that the supply trend of both male and female labour days for all types of groups remain the same. But the level of under employment shows

a different pattern. In the case of male under employment, it did not show such a trend. In both cases large farms had over employment rate. The probable cause behind it may be that the members of other three groups worked in large farm households as off-farm workers.

### Regression Result

The model specified early in the methodology was estimated by using the least squares method in log linear form. The  $R^2$  value estimated in this analysis was 0.861, which implied that about 86 percent of variations in off-farm labour supply was explained by all the independent variables included in the model. The F-value of this model was 52.82 and significant at 1 percent level implying that inclusion of the variables for explaining the variation of farm household supply of work hour for off-farm activities was reasonably accurate.

The regression results presented in Table 11 indicate the expected relationship between explanatory variables and the dependent variable. From the model it may be noted that supply of work hours for off-farm activities depends on most of the variables bearing farm investment, value of farm machinery and years of schooling. The highest (75 percent) positive contribution in this regard was made by the number of male labour whereas the second in order was cash income of the farm household (5.8 percent).

**Table 11: Estimated values of co-efficient and related statistics of log linear function.**

Variables/Parameters	Co-efficient	t-value
Cash income ( $X_1$ )	0.058**	2.227
Number of male labour ( $X_2$ )	0.750*	15.692
Number of female labour ( $X_3$ )	0.028*	3.939
Off-farm investment ( $X_4$ )	0.009*	1.701
Value of farm machinery ( $X_5$ )	0.001	0.314
Age of member ( $X_6$ )	-0.063	-0.644
Years of schooling ( $X_7$ )	0.110*	2.035
Operational holding ( $X_8$ )	-0.013**	-2.168
$R^2$	0.861	
Adjusted $R^2$	0.845	
F-value	52.82*	

Note: \* indicates significant at 1% level

\*\* indicates significant at 5% level

The inverse relation with off-farm work hour supply by the household was observed with operational holding and age of members of the farm household. The result is quite convincing because members possessing larger operational holdings may find employment opportunities in their own farms. Further, as age of an adult member increases he/she prefers to work at home rather than going to work as hired labour outside the household.

As overall comment, it may be noted that the model provided a good fit and the results in general are logical and capable of explaining reality in the study area.

#### IV. CONCLUSIONS

The study has primarily assessed the extent and importance of farm and off-farm activities in a rural area of Gaibandha district in Bangladesh. So it is difficult to achieve appropriate conclusion due to limited scope of the study. However, from the findings of the present study some concluding remarks may be made:

1. Family size is directly related to the off-farm labour supply. Households with more members have a bigger pool of labour available for off-farm work. Farm size is negatively related to the off-farm labour supply. Because additional labour is required to manage farm work.
2. Education level is directly related to the off-farm labour supply. Higher educational levels increase labour skills which enable the workers to do off-farm activities.
3. People belonging to higher income group are more associated with off-farm activities.
4. Farm machinery have positive influence on the supply of labour for off-farm job because of labour saving characteristics which creates a push factor for the labour toward off-farm job.
5. Investment increases household income, which is also one of the main factors contributing to increase in off-farm work. Because increase in incomes raises standard of living which leads the farm families to adopt off-farm works.
6. There is a greater scope of increasing the extent of involvement in off-farm activities because some males and most of the females work in households which are less productive. So it is possible to bring about a reduction in time spent on such work by providing off-farm income opportunities.
7. Off-farm employment can influence to a greater extent the welfare of rural population and should therefore, be considered an important aspect of rural development policy and planning.

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