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THE EFFECT OF EXTENT MICROCREDIT PROGRAMME OF GRAMEEN BANK ON NON-FARM ACTIVITIES: A STUDY IN DHONUT UPAZILA OF BOGRA DISTRICT

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Abstract: The study reveals that the significant of non-farm activities in rural area is being increased more than agricultural activities over time. The study is to examine the effect of microcredit of Grameen bank on non-farm activities in rural area of Bangladesh. About 52.91 percent of people were employed in non-farm activities in Bangladesh while 42.74 percent of people were engaged in non-farm activities in Bogra District. It is revealed by GB that number of village phones and number of bagger members were 1688956 and 77582 members in 2016. Amount of loan disbursement were Tk.1417716 million. Primary data were collected only 130 from borrowers of three branches of Grameen Bank through directly interview method. Statistical and econometric model were used for this study. It is found that a part of the borrower households diverted from agricultural activities from non-agricultural activities or non-farm activities. About 18.46 percent and 6.15 percent of borrower household heads were diverted from agriculture and labour work to multiple sectors which are non-farm activities such as petty business, livestock and poultry raising and auto-rickshaw and auto-pulling, respectively, after joining in GB. The Chi-square test revealed that there is significant association between loan amount of GB and average monthly consumption. In the context, it is shown that the result of the correlation between loan amount and non-farm activities is 0.37. The results of OLS model revealed that GB loan amount, occupation of borrower heads, average level of education, number of income earners and number of female income earners have significant impact on average monthly income of borrower households of GB. It is revealed that income of borrower household for non-farm activities is more than income of borrower household for agricultural activities. The results of the ANOVA tests revealed that loan amount of GB have significant relation with average monthly income of non-farm activities but not significant relation with average monthly income for agricultural activities. The study result reveals that microcredit programme of GB is effective on non-farm activities as well as it can become better outcome in overall country.

Key words: Grameen Bank, Microcredit, Farm and Non-farm Activities of Borrower Households

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1.1 Introduction

Bangladesh economy mainly depends on agriculture with vast population about 159.9 million compared to small area. Most of people in rural area of the country were employed in agricultural activities but they had no enough land for cultivation. Excess people in rural area of the country were engaged in agricultural sector. Average monthly income of these people is satisfactory in this sector. Rest of people in rural areas was also engaged in non-farm activities. Inspite of rapidly the rate of economic growth is being increased, the rate of educated unemployment is not decreased of the country due to lack of employment opportunities and lack of job opportunities. There are some main limitations such as employers, loan opportunity, lack of encouragement of educated unemployment on self-employment, communication, high rate of interest on loan, condition of collateral etc. Poor people and educated unemployment people who want to engage in non-farm activities have no enough opportunity to access to conventional bank or financial institutions due to lack of collateral. Money is essential tool for both farm and non-farm generate activities. In many places in rural areas of the country where there infrastructure for non-farm activities is a problem. There may be a need for road connection and reconstruction of road a village to a market or town. If microcredit institution can organize non-farm activities such as petty business, extending business, fisheries, poultry and dairy farm etc, around rural areas through microcredit programme of Grameen Bank, those poor people will be able to improve more the quality of life. The significant of non-farm activities is being increased because of increasing of population and decreasing of average of land size rapidly. Microfinance institutions provide loan poor people for farm and non-farm activities without collateral. After independent of Bangladesh, many NGO-MFIs have been working for poverty reduction, employment generate (farm and non-farm activities), and development activities in rural areas through microcredit programme. Earlier and several studies showed that microcredit programme of many NGO-MFIs has a positive contribution on non-farm and farm activities (Agyapong et al., 2015, Pitt, 2000, Zia ud Din, 2017; Chowdhury, 2017; Lawin et al., 2018). On the other hand, few studies also showed that microcredit programme of MFIs has a questionable on farm and non-farm activities (Girabi and Mwakaje, 2013, Lawin, et al., 2018). So it is essential to know or examine what

is the effect of microcredit of Grameen Bank on non-farm activities in the present study area?

1.2 Literature Review

Some several and previous studies related with microcredit of microfinance institution have revealed the effect on nor-farm activities in the rural areas of Bangladesh. They searched a relationship between microcredit and business that influence poverty. Microfinance has become a popular programme to reduce poverty by increasing joining the poor people for entrepreneurship.It has apositive contribution on economic, social and environment vulnerabilities besides promoting empowerment of women through increasing social capital in poor community (Banerjee and Jackson, 2017). It is found that microfinance influenced the welfare through increasing non-farm activities in the rural area. Income is used as main indicator of economic well-being of the borrowers. After taking loan, the borrowers employed in non-farm activities and it has a positive impact on income, clothing, healthcare and educational attainments (Agyapong et al., 2015). It is shown that the study examined the impact of microfinance for rural agriculture in Pakistan and Bangladesh. Most of the people depended on agriculture in both countries. It also shows that rural agricultural needs and demands in both countries explained and those are also similar in the study. Indicators of the study are considered such as business loan, agricultural loan, micro-insurance and savings for rural agricultural population. The microcredit programme was succeed and extended in Bangladesh more than Pakistan (Zia ud Din, 2017). He explained the relationship between microfinance and rural non-farm employment in developing countries. Microcredit played role on increasing employment in non-farm activities for women besides household work. It helped to grow new non-farm, extend old non-farm, new employment creation and reduce credit constraints in the developing countries (Chowdhury, 2017). It is found that the study analyzed the effect of microcredit on non-agricultural self-employment and employment in agriculture. Landless cultivators faced more barriers in credit market than others. Both female and male participation in microcredit were significant in own cultivation through sharecropping, where male working time in agriculture was reduced while female working time increased. The wage of male was affected by income and consumption smoothly increased for non-farm activities (Pitt, 2000). They explained the determinants of non-farm livelihood diversification, where access to adequate capital, poor infrastructure and lack of training are the major barriers which hindered farmers from undertaking non-farm activities. Better household, households by literate and younger heads, having access to microcredit,

having extension services and having social responsibilities were influenced in non-farm economic activities. It found that smallholder farmers diverted from agriculture in non-farm activities for lack of extension service in agriculture, providing microcredit, entrepreneur training, skill development and infrastructure development (Asfaw et al., 2017).

They explained the recent trends in rural non-farm (RNF) economic activities in Bangladesh. Probit and Tobit regression model were used for the study. It is found that land ownership, education level of household head, family size, sex of head, asset ownership and access to credit were influence to non-farm economic activities. The importance of non-farm activities is being increased day by day or over time of period (Pramanik et al., 2014). They examined the impact of microfinance on agriculture productivity by smallholder farmers in Iramba district of Tanzania. Credit beneficiaries were usually batter in accessing markets for agricultural commodities, use of inputs and adaptation of farming technology compared to non-credit beneficiaries in case of agricultural productivity. Credit beneficiaries felt some problems such as lack of information, inadequate credit supply, high interest rate and defaulting (Girabi and Mwakaje, 2013). The study was to analyze of microcredit on the empowerment of women through non-farm activities. It is found that non-farm participation was positively association with female school enrollment, household decision on non-farm activities and other factors of women empowerment (Mahmud et al., 2017). They examined that microcredit play role of food security in the rural area. Microcredit helped to poor people diversifying into income generating activities that could improve food security. Microcredit programme participation increases calorie and it indicates that credit has positive impact on food security in short term (Islam et al., 2016). A large part of population or most of the people in the rural areas in developing and lower developing countries depend on agriculture. Rural economic diversification from agriculture to non-agricultural activities has positive role to alleviate poverty, increase and improve food and livelihood security of the rural households (ILO, 2013). It is found that he explained the relationship technical efficiency (TE), cost efficiency (CE) and Traditional variety (TV) with microfinance. In addition, it is investigated and compared between microfinance borrowers and non-borrowers in agricultural sector. It was shown that about 83 percent of non-borrowers had used lower technical efficient. The results of the study indicated that the main determinants are land fragmentation, family size, household asset, on farm-training and off-farm income. The mean of profit efficiency (PE) of the microfinance borrowers and non-

borrowers was 68 percent and 52 percent, respectively (Islam, 2011). He shows that microfinance is a tool to reduce poverty. It has a marginal impact on both social and economic well-being of the borrowers of the credit facility. About 54 percent of respondents indicate that the credit do have a positive impact on their household income. About 70 percent and 51 percent got educational facilities for their children and health care services for themselves after accessing the credit facility (Adams, 2010). He examined the role of microfinance in the development of non-farming sectors in the rural area. Diversification of agriculture not only provides more engagement to human labour but also increased productivity of land and labour. Extension of non-farm activities in rural area apprehended the large scale rural-unban migration. The non-farm wage rate is higher compared to agricultural wages (Maddulapalli, 2015).

1.3 Microcredit of Grameen Bank and Non-farm Activities in Rural Area

In December 1976, Grameen Bank Project (GBP) operations were introduced at the Jobra village in Chittagong district of Bangladesh. Grameen Bank as village bank was established and started group based on microcredit programme among poor people in the rural area of Bangladesh on 2nd October 1983. Since establishment of GB, this institution has been working on poverty reduction, standard living, women empowerment and other development programmes such farm and non-farm activities. According to Annual Report of Grameen Bank in 2016, the rate of interest of Grameen Bank depends on repayment capacity for example loan for income generating activities (IGA) (farm and non-farm generating activities), housing loans, education loans and struggling members' loans, etc.

On the other hand, most of the people in rural area of Bangladesh were employed in agricultural sector who are marginal farmers having land below 50 decimals. According to HIES (Household Income and Expenditure Survey), it is found that 4.6 percent and 5.6 percent of people had no land in 2010 and in 2000, respectively, and 60.5 percent and 60.0 percent of people, marginal farmers, had land in between 0.01-0.49 decimals in 2010 and 2000. Where, 26.2 percent of people were small farmer having land 0.50- 247 decimals in 2010. Average land size in rural area is being decreased in the country due to increasing population rapidly day by day. Around 26 lakh of the 6.21 crore strong labour force of Bangladesh were unemployment in 2015-2016 (BBS). The unemployment rate of female (12.8 percent) was higher compared to men (9.1 percent). According to ILO, 2013 disadvantage group are considered as women, the unemployed, underemployed, poor and informal workers (ILO, 2013). Rural areas also profound transformation as rural workers moves out of

agriculture to non-farm activities. Overall developing world, non-farm sectors is increasingly significant economic growth and can induce migration (GMR, 2013).

If GB encourages to poor people and educated unemployment people and provides enough loan for income generate activity in non-farm activities, a number of these people may engage in this sector. It may help to reduce pressure on unemployment and excess pressure on agriculture sector. Women in rural area are more likely than men to employ in non-farm self-employment but wage women is less than men. Non-farm activities are more liked among more educated individuals in landless households, where farm activities are liked more in uneducated people (Vasco and Tamayo, 2017). According to (Yearbook Agricultural Statistics-2016) 13512580 (47.09 percent) and 15183183 (52.91 percent) people out of 28695763 were employed in non-farm holdings and farm holdings overall Bangladesh while 338196 (42.74 percent) and 453147 (57.26 percent) were engaged both in non-farm holdings and farm holdings, respectively, in Bogra district. He examined on the structure of employment in Bangladesh's rural non-farm sector and its potential to generate sustainable employment. The rural non-farm sector is less productive compared to rural sector. The wage of non-farm sector is more than on the going agricultural wage rate (Varma and Kumar, 1996). Other studies found the relationship between microcredit and non-farm activities that referred to Islam et al., 2016; Mahmud et al., 2017, Shilpi and Emran, 2016, etc. In addition, Grameen Bank was working some special programme such as Village Phone Programme and Beggars Programme of Grameen Bank beside poverty reduction to poor people for non-farm activities and it has a positive contribution on economic. In the village phone programme, women entrepreneurs could be begun their business for non-farm activities and the GB provided only to them wireless payphone service in village areas. It is found that number of village phones was 21409 in 2002 that increased to 1688956 in 2016. It indicates that number of employees with increasing number of village phones was more in 2016 than in 2002 rapidly. On the other hand, Beggars Programme of Grameen Bank is called struggling members programme. The GB gives microloan to the beggars to begin petty business according to this condition that is for giving up begging. All loans of GB are interest free for beggars and it is authorized for a long period of time where repayment installment is very small. It is shown that the number of beggars was 34077 in 2004 which increased to 77582 in 2016. In the context, amount of loan disbursement was 17.91 (in Million Tk.) in 2004 and 127.72 (in Million Tk.) in 2016. However, an authored capital and a paid-up capital of Grameen Bank were Tk.100 million

and Tk.30 million, respectively, in 1983 (Majumder, 2002). At present, amount of total balance deposit and amount of loan disbursement were Tk.199497 million and Tk.1417716 million, respectively. It is indicated that the activity of Grameen Bank is extended day by day.

1.4 Objectives of the Study

The prime objective of the study is to examine the effect of extent microcredit programme of Grameen Bank (GB) on non-farm activities of borrower households. The prime objective is specified as below

1. To explain the relationship between microcredit of GB and non-farm activities of borrower households in the study area.

2. To determine the effect of microcredit of Grameen Bank on non-farm activities of borrower households in the study area.

1.5 Hypothesis of the Study

The following hypothesis of the study was tested.

H0: There is no association between microcredit of Grameen Bank and non-farm activities in the study area at present.

H1: There is an association between microcredit of Grameen Bank and non-farm activities of borrower households in study area at present.

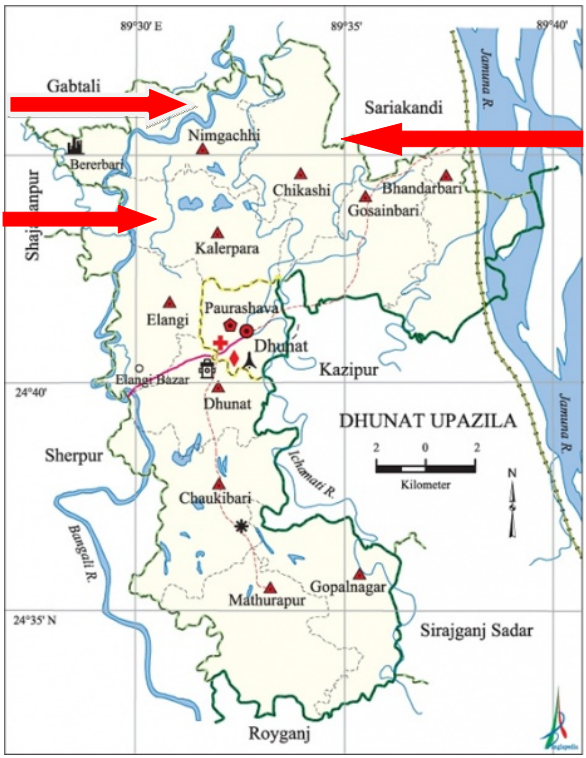
1.6 Study Area

Dhunat upazila is an upazila of Bogra district in Rajshahi division, Bangladesh in 1983 which was established as thana in1962. The area of the upazila was only 247.73 sq Km (95.65 sq mi). The number of total population of the upazila was 270810 (3013035 numbers in district) in 2001 which increased to 292404 (3400874 numbers in district) in 2011 (population and housing census, 2011). Density per sq. Km of population was 1093 in 2001 which increased to1180 in 2011. The rate of literacy of the upazila was 31.1 percent in 2001which stood at 35.6 percent in 2011. It indicates that the rate of literacy of the upazila is comparatively lower than others upazilas of Bogra district. According to Bangladesh census in 2011, about 7.8 percent and 92.2 percent people of the upazila in Bogra district lived in the urban and the rural area, respectively. Most of the people in the study area depend on agriculture. Main croups of the study area are paddy, wheat, jute, mustard and vegetables etc. About 72.20 percent and 27.8 percent of income of the upazila earn from farm activities and non-farm activities respectively. There are ice factory, rice mill, flour mill and welding factory called manufactory. Goldsmith, blacksmith, weaving, potteries, embroidery, bamboo and wood work are called cottage industry. Most of people of the upazila live in the rural areas compared to the urban area. About 61.33 percent and 38.67 percent of people have ownership of agricultural land and landless, respectively, of the upazila (Bogra district). A part of people are engaged in non-agricultural activities such as (manufactories) rice mill, ice factory, soap factory and (cottage industries) goldsmith, weaving, potteries blacksmith, etc besides

agricultural activities. Grameen Bank provides loan to poor people for both farm activities and non-farm activities in the study area. The different types of loan of GB are flexible loan, housing loan, education loan for borrower children, beggar loan (struggling member loan). Overall country, there are 2568 branches of GB under 40 zonal offices in 2018. Three branches of Grameen Bank in the study area were selected randomly and these are Nimgachhi, Elangi and Chikashi branches respectively, of Dhunat areas in Bogra district of Bangladesh. Three branches are presented in Figure 1.1.

Figure 1.1: Selected three branches in the study area on Map at Dhunat upazila in Bogra district.

Figure 1.1: Map of Dhunat Upazila in Bogra District



1.7 Methodology

In spite of both primary and secondary data were used for this study but mainly primary data were used for statistical and econometric analysis. Primary data were collected from Grameen Bank borrowers who involved with microfinance of GB at least four years. Total sample size of the study was 130 only. In addition, 42 and 88 borrower household heads are employed in farm and non-farm activities, respectively. SSPS and STATA as software were used to estimate for the study. Chi-square test and ANOVA test were applied to test different relation with loan amount of GB.

Again OLS (Ordinary Least Square) method was used to determine the factors that influence the non-farm activities of borrower households in the study area. The R2 value indicates for goodness of fit that lies in between 0 and 1. The value of its close to one shows the better fit. In social science study it is difficult to get R2 to be close 1. Some studies in social science study were shown that R2 close to 0.40 and it means satisfactory acceptance (Rahman, 2007; Khandaker, 2003; Moksony, 1990).

Most of the variables used in OLS model are qualitative such average monthly income of borrower households of GB (AINC), average level of education of borrower households (AEDU), occupation of borrower household heads (OCCU), loan amount of borrower households from Grameen Bank (LON), size of total land (LND) of borrower households, accumulated savings (ACCUSAV) of borrower households, number of income earners (ERNR), number of female income earners (FERNR), training from Grameen Bank and other institutions (TRAN) and social network in society (SOCLNET). In this study, OLS model was used to examine the effect of microcredit of Grameen Bank on non-farm activities following the study (Agyapong et al., 2015).

$$Y_i = f(X_i) \quad \ldots (1)$$

Where, Yi is average monthly income of borrower households both for farm and non-farm activities after joining in Grameen Bank and Xi is a set of socio-economic.

$$Y_i = \beta_0 + \beta_1 X_{1_i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i} + \beta_9 X_{9_i} \quad \ldots (2)$$

$$AINC_i = \beta_0 + \beta_1 (AEDU)_i + \beta_2 (OCCU)_i + \beta_3 (LON)_i + \beta_4 (LND)_i + \beta_5 (ACCUSAV)_i + \beta_6 (ERNR)_i + \beta_7 (FERN)_i + \beta_8 (TRAN)_i + \beta_9 (SOCLNET)_i + \mu \quad \ldots (3)$$

The explanatory variables of the equation (2) are presented in Table 1.1 as below.

Table 1.1: Description of Variables using in OLS model

Name of Variables	Type	Measurement	Expected sign
AINC	Continuous	Average monthly income (Tk.000)	
AEDU (X_1)	Continuous	Average level of education of borrower households (years of schooling)	+
OCCU (X_2)	Dummy	'1' for non-farm activities; otherwise '0'	+/-
LON (X_3)	Continuous	Loan size of Grameen Bank (Tk.000)	+
LND (X_4)	Continuous	Size of total land (decimals)	+/-
ACCUSAV (X_5)	Continuous	Accumulated Savings (Tk.000)	+
ERNR (X_6)	Continuous	Number of income earner	+
FERNR (X_7)	Continuous	Number of female income earner	+
TRAN (X_8)	Dummy	1 if access training, 0 otherwise	+/-
SOCLNET (X_9)	Dummy	'1' for good social network; otherwise '0'	+

It is found in Table 1.2 that partial correlation matrix of the explanatory variables is found multicollinearity problem. Non-farm activities of borrower households is influenced by some explanatory variables that are existed multicollinearity problem but not serious problem for OLS model.

Table 1.2: Partial Correlation Matrix of the Explanatory Variables At Present

	AEDU	OCCU	LON	LND	ACCUSAV	ERNR	FERNR	TRAN	SOCLNET
AEDU	1.00								
OCCU	0.38	1.00							
LON	-0.03	-0.08	1.00						
LND	0.23	0.01	0.07	1.00					
ACCUSAV	0.03	-0.03	-0.05	0.12	1.00				
ERNR	0.11	0.32	-0.03	0.12	0.22	1.00			
FERNR	0.25	0.35	-0.23	0.07	0.04	0.22	1.00		
TRAN	-0.13	0.31	-0.08	-0.02	0.09	0.05	0.31	1.00	
SOCLNET	0.04	0.03	-0.41	-0.05	0.04	0.01	0.23	0.02	1.00
Source: Calculation from Field Survey, 2018									

1.8 Empirical Result of the Study

Both statistical tools and econometric analyses were also applied to examine the effect of microcredit of GB on non-farm activities in the study areas.

1.8.1 Statistical Result

In the study area, borrower household heads were employed both in farm and non-farm activities. They were involved in different type of activities

and sometimes same person were employed in different activities. Occupation usually is divided into two types such as farm and non-farm activities. It is found in Table 1.3 that 39.23 percent

Table 1.3: Employment in Farm and Non-Farm Activities of Household Heads of GB Borrowers

Before Joining in Grameen Bank			At present	
Occupation Status	Frequency	Percent	Frequency	Percent
Agriculture	51	39.23	27	20.77
Day labour	25	19.23	17	13.08
Petty business	30	23.08	39	30.00
Livestock and Poultry raising	6	4.62	12	9.23
Van/ Rickshaw/Auto pulling	18	13.85	35	26.92
Total	130	100	130	100
Mean	2.71		3.65	
Source: Authors' Primary Data Calculation, 2017				

of borrower household heads were employed in agriculture before joining in GB . At present, 20.77 percent of borrower household heads are engaged in agriculture and it indicates that about 18.46 percent of borrower household heads diverted from agriculture to other activities. In this context, before joining in GB, 19.23 percent, 23.08 percent and 13.85 percent of borrower household heads were engaged in day labour, petty business and rickshaw or auto pulling, respectively. It is found in Table 1.3 that 20.77 percent and 30.00 percent and 26.92 percent of borrower household heads are employed in agriculture, petty business and rickshaw or auto pulling, respectively, at present. This means that percentage of petty business and rickshaw or auto pulling has increased more at present than before joining in GB.

The study is to explain the effect of microcredit of GB on non-farm activities in Dhunat upazila of Bogra district. Table 1.4 shows that the descriptive analysis of the present study was explained such as mean, minimum, maximum and standard deviation values of the main variable in the study.

Table 1.4: Descriptive of Variable Analysis of Sample at Present

Variables	Minimum	Maximum	Mean	Std. Deviation
Average monthly income (farm and non-farm)	1950.00	10454.00	4522.14	2103.02
Average monthly income (non-Farm)	2850	11433	5134.85	1755.55
Average monthly income (farm)	1990	9350	3955.82	2955.00
Average level of education	1.25	9.59	3.45	1.45
Occupation of borrower' heads	0.00	1.00	0.725	0.45
Loan amount from GB	9000.00	90000.00	25192.31	17385.77
Size of total land	5.00	165.00	36.57	38.49
Accumulated saving	960.00	41050.00	3446.15	9604.25
Number of income earners	1.00	5.00	1.8	0.87
Number of female earners	0.00	2	0.74	0.58
Training from GB and Others	0.00	1.00	0.15	0.35
Social network	0.00	1.00	0.09	0.29

Source: Author's own calculation, 2018

The average monthly income of farm and non-farm activities was Tk.4522.14 with minimum Tk.1950.00 and maximum Tk.10454.00, respectively. In the context, average monthly income of farm and non-farm activities individually was Tk3955.82 in farm and Tk5134.85 in non-farm with minimum Tk1990.00 in farm and Tk2850.00 in non-farm and maximum Tk9350.00 in farm and Tk11433 in non-farm, respectively. It is observed in Table 1.4 that the mean of loan amount of Grameen Bank was Tk.25192.31 with minimum Tk.9000.00 and maximum Tk.90000.00. In the study area, borrowers took loan amount in between Tk.9000-90000. Average level of education of borrower households was 3.45 with minimum 1.25 and 9.59 maximum, respectively. Education loan for children of borrowers is section by GB for 3-5 years without any interest. After study breaking, GB imposes the rate of interest in 5 percent on the education loan. The mean of occupation of borrower household heads was 0.725 with minimum zero (0.00) and maximum 1.00. The borrower household heads was employed both in farm and non-farm activities. It is found in Table 1.4 that average land size of borrower households was 36.57 decimals with minimum 5.00 decimals and maximum 165.00 decimals. Average accumulated savings of borrower households was Tk.3446.15 with minimum Tk.960.00 and maximum Tk41050.00. The mean of number of income earner and number of female income earners individually was 1.8 with minimum 1.00 and maximum 5.0 and 0.74 with minimum zero (0.0) and maximum 2, respectively. After taking loan from GB, the number of female income earner has been increased in borrower households. Without those descriptive variables, the mean, minimum and maximum values of training and social networks were presented in Table 1.4

Result of Chi-Square Tests

Chi-square tests associate between the average monthly consumption of borrower households and loan amount of Grameen Bank at present. It is found in Table 1.5 that 33.08 percent and 16.92 percent of borrower have taken loan amount from GB in between Tk10001-20000 and Tk20001-30000, respectively. It indicates that most of the borrowers took loan in these levels. On the other hand, 10 percent and 7.69 percent, 11.54 percent and 5.38 percent of borrowers have taken loan amount in the range of Tk0-10000, Tk40001 -50000 and Tk50001-above, respectively. Again, it is shown in Table 1.5 that 25.38 percent and 51.54 percent of borrower households have average monthly consumption below Tk2000 and in the rage of Tk2001-4000.

Table 1.5: Chi-Square Tests Associate between Loan Amount of Grameen Bank and Average Monthly Consumption of Borrower Households

Consumption and Loan Amount	0-2000	2001-4000	4001-6000	6001-Above	Total	Percentage
0-10000	13	18	2	0	13	10
10001-20000	2	26	5	4	43	33.08
20001-30000	5	11	6	0	22	16.92
30001-40000	2	5	3	0	10	7.69
40001 -50000	3	6	5	1	15	11.54
50001-above	2	1	3	1	7	5.38
Total	33	67	24	6	130	100
Percentage	25.38	51.54	18.46	4.62	100	

Source: Author's own calculation, 2018

Table 1.5 provides that about 4.62 percent of borrower households had average monthly consumption in between Tk6001-Above. It indicates that low percentage of borrower households consumed in this level.

On the other hand, Table 1.6 provides that at present, this statement is investigated by Chi-square test which shows that there exists a significant relationship between loan amount and average monthly consumption of borrower households.

Table 1.6: Chi-Square Tests between Loan Amount of Grameen Band and Average Monthly Consumption of Borrower Households

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.853[a]	15	0.09
Likelihood Ratio	25.289	15	0.05
Source: Author's own calculation, 2018			

It is found in Table 1.6 that the value of Chi-square is 22.85 and it means a significant at level of 10 percent between loan amount and average monthly consumption of borrower households at present.

Result of Hypothesis

Table 1.7 provides that the result of correlations between loan amount and non-farm activities is positive and statistically significant at 0.05 percent level. It is found in Table 1.7 that the result of the correlation between non-farm activities and loan amount is 0.37.

Table 1.7: Correlations Loan Amount and Non-Farm Activities in the Rural Area

	Non-Farm Activities	Loan Amount
Non-Farm Activities	1	0.37*
Loan Amount	0.37*	1
**Correlation is significant at the 0.05 level		
Source: Authors' Primary Data Calculation, 2018		

On the other hand, Table 1.8 shows that the results of the correlation between non-farm activities on agriculture, day labour, petty business, livestock and van/auto-rickshaw with loan amount are 0.17, 0.13, 0.51,

0.18 and 0.41, respectively. The highest and positive correlation between petty business on non-farm activities and loan amount is 0.51 which indicates statistically significant at 5 percent level. The lowest correlation between day labour and loan amount is 0.13.

Table 1.8: Correlations for Agriculture, Day Labour, Petty Business, Livestock, Van/Auto-Rickshaw and Amount of Loan

Control Variables	Agriculture	Day Labour	Petty Business	Livestock	Van/Auto-Rickshaw	Loan Amount
Agriculture	1.00					0.17
Day labour		1.00				0.13
Petty business			1.00			0.51 **
Livestock				1.00		0.18
Van/Auto-Rickshaw					1.00	0.41
Loan Amount	0.17	0.13	0.51**	0.18	0.41	1.00
Correlation is significant at the 0.05 level						
Source: Authors' Primary Data Calculation, 2018						

Result of ANOVA Test

In case of ANOVA test, it reveals and compares average monthly income two groups such as farm and non-farm group. It is found in Table 1.9 that the result of one-way ANOVA test shows that exists statistically significant prelateship between loan amount and average monthly income for non-farm activities at 10 percent level.

Table 1.9: The Result of One-Way ANOVA Test Loan Amount of GB and Average monthly Income in Non-Farm Activities

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	140520116.39	31	4532906.98	1.519	0.086
Within Groups	167163018.47	56	2985053.90		
Total	307683134.86	87			

On the other hand, Table 1.10 provides that the result of one-way ANOVA test reveals that exists statistically not significant prelateship between loan amount and average monthly income for farming activities.

Table 1.10: The Result of One-Way ANOVA Test Loan Amount of GB and Average monthly Income in Farm Activities

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6150332.84	15	410022.19	1.07	0.43
Within Groups	9976396.79	26	383707.57		
Total	16126729.64	41			

1.8.2 Regression Result

OLS Regression for the equation (3) as non-farm activities was used to test the effect of microcredit of GB on non-farm activities that is average monthly income, dependent variable, which is influenced by some explanatory variables. Results of OLS Regression analysis for non-farm activities were found in Table 1.11 that about 73 percent of variations in the dependent variable was explained the variation in independent variables integrated in case of the equation that is shown by the value of R2 (R2 = 0.7308). The overall significance and fitness for OLS model are checked by F-value (F = 36.19). It indicates that the explanatory variables consistently predicted the dependent variable of the OLS model for non-farm activities. The mean value of VIF test and value of Durbin-Watson test is 1.25 and 1.89, respectively. There were no serious problems such as multicollinearity and autocorrelation for OLS model analysis but might be existed heteroscedasticity problem in this model.

Table 1.11: OLS Regression Analysis for Average Monthly Income of Borrower Household for Non-Farm Activities

Variables	Coefficient	Std. Err.	t-ratio	Prob.	VIF
Constant	1614.61	207.71	7.77	0.00	-
Average level of education (AEDU)	219.01*	23.77	8.42	0.00	1.42
Occupation of borrower' heads (OCCU)	433.45*	36.77	11.79	0.00	1.40
Loan amount from GB (LON)	312. 47 ***	12. 37	1.75	0.08	1.28
Size of total land (LND)	-0.004	0.003	-0.25	0.80	1.22
Accumulated saving (ACCUSAV)	-1.56	1.27	-1.23	0.22	1.18
Number of income earners (ERNR)	726.03**	251.09	2.04	0.04	1.40
Number of female earners (FERNR)	300.46 **	143.87	2.09	0.03	1.12
Training from GB and Others (TRAN)	-41.75	64.42	-0.65	0.52	1.08
Social network (SOCLNET)	68.43	191.37	0.36	0.72	1.13
Number of obs. = 130; F (9,120)= 36.19; Prob.> F = 0.0000; R^2 = 0.7308; Adj R^2 = 0.7106; and Root MSE = 533.21, Mean of VIF = 1.25 and Durbin-Watson = 1.889					
Note: *** Significant at 1%; ** Significant at 5% and * Significant at 10%					
Source: Calculation from Field Survey, 2018					

Table 1.11 provides that the coefficients of average level of education of borrower households (AEDU), occupation of borrower household heads (OCCU), loan amount from Grameen Bank (LON), number of income earners (ERNR) and number of female income earners (FERNR) are statistically significant and positive with average monthly income of borrower households. Table 1.11 provides that the coefficient of loan amount from GB is statistically significant level at 10 percent and positive relationship with average monthly income.It means that average monthly income is increased by Tk312.47 if loan amount from Grameen Bank will be increased by Tk.000. It may be fact that loan amount of borrowers of GB was engaged in farm and non-farm activates. It is observed in Table 1.11 that the coefficient of average level of education of borrower households is statistically significant level at 1 percent. It indicates that average monthly

income of borrower households is increased Tk219.01 monthly, if an additional year will be added to average level of education of borrower households. It may be fact that more educated person take right and quick decision more than less educated person in case of investment that whether he or she will be employed himself or herself in farm or non-farm activities. Again the coefficient of occupation of borrower household heads is also statistically significant level at 1 percent and positive with average monthly income of borrower households. This means that average monthly income is increased by Tk433.45 if a borrower household head will be employed in non-farm activities from agricultural activities. It may be fact that borrower household heads were employed more in non-farm activities than agriculture or farming activities after taking loan from Grameen bank. In addition, it may also be fact because of increasing income for non-farm activities than farming activities.

Table 1.11 shows that the coefficients of number of income earners and number of female income earners of borrower households are statistically significant at 1 percent level and positive relationship with average monthly income of borrower households. It indicates that average monthly income of borrower households is increased by Tk726.03 and Tk300.46, respectively, if an additional number in both case of number of income earners and number of female income earners will be added with number of incoming member of borrower households. On the other hand, the coefficients of size of total land of borrower households (LND), accumulated savings (ACCUSAV), training (TRAN) and social network (SOCLNET) are not statistically significant with average monthly income.

1.9 Conclusion and Recommendations

Results of the study are statistical and econometrics analysis. In the study, average monthly income is influenced by some selected variables such loan amount, occupation, average level of education, number of male and female income earners. It is found that borrower households diverted from agricultural sector to non-farm activities after joining in Grameen Bank. It indicates that 39.23 percent of borrower household heads were employed in agriculture before joining in GB and reduced it. At present, about 20.08 percent of borrower household heads are engaged in agriculture. While number of day labour and number of agricultural employee of borrower household heads are being decreased, number of petty businessmen, number of auto-rickshaw or auto-pulling and number livestock and poultry raising of borrower household's heads are being also increased at present.

Chi-square test shows an association between average monthly consumption of borrower households and loan amount from Grameen

Bank at present is statistically significant at 10 percent level and the value of Chi-square was 22.853. The results of OLS regression analysis found that the coefficients of average level of education of borrower households, occupation of borrower household heads, loan amount of GB, number of income earners and number of female income earners are statistically significant at different level with average monthly income of borrower households.

It is found that the result of the correlation between non-farm activities and loan amount is 0.37 which is statistically significant level. It may be fact that borrower households get loan opportunity and most of the borrower households spends or invests in income generating activities specially, in non-farm activities. Results of OLS regression model show that loan amount of GB have significant impact on non-farm activities of borrower households. The results of OLS model confirmed that average monthly income of borrower households is influenced significantly and positively with average level of education of borrower households, loan amount of GB, occupation of borrower household heads, number of income earners and number of female income earners. In addition, the result of one-way ANOVA test shows that exists statistically significant prelateship between loan amount and average monthly income in non-farm activities at 10 percent level but not significant with farming activities.

Recommendations

(I) Microfinance institutions should provide credit comparatively in disadvantage rural area's households of Bangladesh.

(II) There should organize enough training and enlighten of education for uneducated people so that they are to be more confident for investment in more profitable sectors or non-farm activities.

(III) Taking loans are not exhausted through consumption by borrower households. Therefore the institution should be monitoring and supervising sometimes.

(IV) GB should encourage that excess people in agricultural sector should be diverted to non-farm activities in rural area. Loan size should be extended for non-farm activities. Since taking a loan the first installment should start three months later.

(V) Government should encourage to MFIs so that they provide a specific part of loan to young and unemployment energetic people who want to employ themselves in non-farm activities willingly.

(VI) Government should ensure that microcredit loans are more reasonable and available to rural household. The rate of interest of Grameen Bank should reduce and set up compared to other commercial banks in Bangladesh.

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