

Full Length Research Paper

Microcredit's contribution to the socio-economic development amongst rural women: A case study of Panchagarh District in Bangladesh

Ferdoushi Ahmed^{1*}, Chamhuri Siwar¹, Nor Aini Hj. Idris² and Rawshan Ara Begum¹

¹Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia, 43600, UKM, Bangi, Selangor D. E., Malaysia.

²Faculty of Economics and Management, Universiti Kebangsaan Malaysia, 43600, UKM, Bangi, Selangor D. E., Malaysia.

Accepted 27 July, 2011

Rural women in Bangladesh have a lower socio-economic status compared to men. They have very limited access to income generating as well as social activities due to number of social, cultural and religious barriers. Thus, microcredit programme is intended for improving the socio-economic status of rural women in Bangladesh. In the present study, an attempt has been made to assess how microcredit programme contributes to the socio-economic development of rural women. The study is based on empirical data collected through interviewing the two groups of rural women for example, 'with credit' and 'without credit' rural women. A multiple regression analysis was conducted to identify the factors influencing the respondent's contribution to the total monthly family income. The multiple regression analysis shows that there were strong positive effects of age of respondent, level of education, family size, earning member, occupation of respondent's, and also monthly income of respondent's while status of marriage has a strong negative effect. It was found that majority of the 'with credit' respondents contribute much higher to the family incomes than the 'without credit' respondents. The results also reveal that the 'with credit' respondents show higher educational attainment (schooling, secondary and higher secondary certificates) as well as engage in economic and social activities in a larger scale compared to 'without credit' respondents. The study concludes that microcredit programme contributes to the development of socio-economic status of rural women in Bangladesh through adequate and timely availability of credit for income generating and productive activities, improving women's education level, and initiating skill development training.

Key words: Rural women, socio-economic status, microcredit programme, Bangladesh.

INTRODUCTION

Bangladesh is one of the least developing countries in

the World. Almost 80% people live in rural areas (2006a). Women are almost half of the total population of this country (2006a). The status of women is an important factor affecting the socio-economic development of a country. There are many microcredit programmes in Bangladesh for rural poor women for their development. Microcredit programmes provide small loans to the very poor in order to undertake self employment and other financial and business activities giving them the ability to care for themselves and their families and thus, achieve a level of independence. Microcredit is also referred to as microfinance and micro lending which has demonstrated to be an effective tool in the ongoing struggle against poverty and enables those without access to lending

*Corresponding author. E-mail: ferdoushi03@yahoo.com. Tel: +60143626210. Fax: +603-89255104.

Abbreviations: BRDB, Bangladesh Rural Development Board; GB, Grameen Bank; PKSF, Pallil Karma Sahayak Foundation; BRAC, Bangladesh Rural Advancement Committee; ASA, Association for Social Advancement; PDBF, Palli Daridro Bimochon Foundation; SPSS, Statistical Package for Social Science; SSC, Secondary School Certificate; HSC, Higher Secondary Certificate; NGO, non-governmental organization; CSFP, Commonwealth Scholarship and Fellowship Plan.

institutions to borrow and start small business (ABS, 2005). In Bangladesh, the major microcredit programmes engaged by government organizations such as Bangladesh Rural Development Board (BRDB), Grameen Bank (GB), Pallil Karma Sahayak Foundation (PKSF), and Non government organization like Bangladesh Rural Advancement Committee (BRAC), Association for social Advancement (ASA), PROSHIKA, Palli Daridro Bimochon Foundation (PDBF). Among these microcredit programmes, GB is a successful model of poverty alleviation in Bangladesh. GB was started in 1976 by Professor Muhammed Yunus as an action research project in 'Jobra village' in the district of Chittagong. In 1983 it was transformed into a formal bank under a special law passed for its creation. It is owned by the poor borrowers of the bank who are mostly women. Borrowers of GB at present own 94% of the total equity of the bank. Remaining 6% is owned by the government (GB, 2007). In 1976, Professor Yunus lent US\$ 27 in loans to 42 women in Jobra, Chittagong, Bangladesh. At the end of July 2009, GB had cumulatively disbursed Tk 465.29 billion (US\$ 8.26 billion) to 7.93 million borrowers, 97% of whom are women, 2,558 branches, in nearly 84,573 villages across Bangladesh (GB, 2009). During the past 12 months (from August 2008 to July 2009) GB disbursed Tk. 72.98 billion (US \$ 1060.42 million). Monthly average loan disbursement over the past 12 month was Tk 6.08 billion (US \$ 88.37million).

In Bangladesh, traditionally the role of women has been that of daughter, wife and mother. Their activities in the socio-cultural milieu of Bangladesh are primarily domestic in nature confined to the four walls of home (Islam and Sultana, 2006). In the rural areas of Bangladesh, social capital is scarce because "purdah" norms isolate women. Grameen meetings provide a socially accepted excuse to gather and to talk. Thus, GB borrowers have succeeded in defining "purdah" more flexibly expanding the concept of 'inside' to include their GB activities. Just by requiring their presence in public places, the Bank has increased women's visibility (Todd, 1996). The impacts are both psychological and economic; not only do women feel less isolated, but they also strengthen their support networks (Larance, 2001). In 1998, again, Pitt and Khandker (1998) used different data and controlled for unobserved heterogeneity at the individual, household, and village levels. They found that annual household expenditure increased by \$18 for each additional \$100 of cumulative disbursement. If this effect persists and if the average effect exceeds the marginal effect, then the increase in expenditure by itself would provide at least \$0.09 per dollar-year borrowed to balance the subsidy of \$0.22. Pitt and Khandker (1998) also find that the value of women's non-land assets increased by \$27 for each additional \$100 disbursed. Bernasek (2003) also revealed that participation in GB microcredit programme has increased women's income and their contribution to overall family income. Likewise, Ali (2008) estimated that the average household income of GB members is about 50% higher

than the target group in the control village and 25% higher than the target group non-members in GB villages. Therefore, Newaz (2007) found that women had hardly had any choice of their own in purchase clothing, Sari in particular. They usually could afford only one Sari at a time. After gaining credit access, most of them were having better experience since they could afford more than one Sari and they could buy Sari of their own choice on occasions and during festivals. This paper shows a case study of Panchagarh district of Bangladesh. This paper also discusses the socio-economic variables such as age, level of education, marital status, occupation, family size, distribution of earning and dependent person and also income status that contribute to the rural women's income.

MATERIALS AND METHODS

Survey design, data collection and data analysis

Deriving accurate information is highly dependent upon the survey method. The direct face-to-face interview is the most commonly used approach (Carson et al., 1996) and is employed in this study. The data for this study is taken to reflect the objectives of the study. Data was collected through interview from the selected samples of Panchagarh Districts with two groups ('with credit' and 'without credit') of rural women. GB members are chosen for 'with credit' respondents. For the 'with credit' samples, this study has selected 200 samples from the GB members in the villages of Pokhi Laga, Vetur gor, Chand para and Madhuban guchchho gram. For the 'without credit' samples, this study has selected 100 samples from the Goual para and Jamader para villages, which do not bear loan or credit. The data were collected by the researcher herself and the period was from 1st April 2008 to 30 June 2008. After survey of the study, all the data were coded directly on questionnaires and then entered into personal computer. Several analyses of the data have been carried out in the core of this study. Simple descriptive statistics such as sums, means, ranges, percentages and frequency distributions are used to analyse primary data for this paper. This study utilised the Statistical Package for Social Science (SPSS) to analyse the data. This study also conducted a multiple regression analysis for determining factors which are affecting the respondent's contribution to the total family income.

Multiple regression analysis

Regression analysis is one of the most commonly used tools in econometric work. The general purpose of multiple regression analysis is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable. Applications of regression analysis exist in almost every field such as economics, political science, sociology, psychology, education, etc. The common aspect of the applications is that the dependent variable is a quantitative measure of some condition or behaviour. Throughout, it is concerned with multiple linear regression models, that is, models linear in the parameters, which may or may not be linear in the variables. However, the k-variable multiple linear regression models is specified as follows (Gujrati, 2003): the dependent variable is assumed to be a linear function of one or more independent variables plus an error introduced to account for all other factors: In this study, a multiple regression model will be used to determine factors which are affecting the respondent's contribution to the total family income. The model is:

$$Y = \beta_0 + \beta_i X_i + e$$

That is,

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \dots + \beta_n X_n + e$$

Where, Y = Dependent variable (Amount of total family income, Taka), X_i = Independent variable (Age (X_1), Marital status (X_2), Education (X_3), Family size (X_4), Number of earning members (X_5), Respondent's occupation of farmer (X_6), Monthly income of Respondent's husband (X_7) and Monthly income of respondents (X_8), (etc.)

β_0 = Constant term

β_i = Coefficient of independent variables

e = the error/disturbance term

i = 1, 2, 3, n.

Description of variables

Total monthly family income

This variable was measured by taking in to consideration all the existing family members' (such as respondent, husband, son, daughter, father, mother, etc) income of the respondent households'.

Age

Age of the respondent women referred to the period of time from her birth to the time of interview. Age was measured in years on the basis of her responses.

Marital status

Marital status of a woman respondent referred to relatively permanent bond between permissible mates. The score of married respondent was taken as 1 and the score of widow and divorcee respondent woman was taken as 2 and 3.

Education

Education was measured in terms of grades passed by the respondent women. For example, if the respondent's never go school, her educational score was 0, if the respondent passed the final examination of class 1 to 5, her educational score was taken as 1. If the respondent passed the final examination of class 6 to 10, her educational score was taken as 2 and if the respondent passed the final examination of class 10 to 12, her educational score was taken as 3. Finally if the respondent passed the final examination of graduate/university and post graduate/ masters and above, her educational score was taken as 4 and 5.

Family size

Family size of a respondent woman referred to the total number of individuals in her family including herself, her husband, children and other family members or dependents.

Earning members of the family

The total number of earning members in the family was considered

as a variable. It was assumed that, as the number of earning member increases in the family, total earning income also would increase.

Occupation of respondent

If respondent's occupation is agriculture (farmer) then score 1 and others 0.

Respondent's husband income

Monthly income of a respondent was measured in taka on basis of his total monthly earning from farm and non-farm sources in which respondent was involved.

Respondent's income

Monthly income of a respondent was measured in taka on basis of her total monthly earning from farm and non-farm sources in which respondent was involved.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondent

The present study shows of socio-economic status of with credit and without credit rural women of Panchagarh district. These will help to have a fair knowledge about their resource base as well as educational background. An effort has, therefore, been made in this paper to describe briefly some of the basic socio-economic status of the respondents. Socio-economic status of 'with credit' rural women may have an important bearing on the receipt of loan from the institutional sources. However, the present study has taken in to consideration. The following status such as age, educational level, marital status, occupational status, family size, distribution of earning and dependent person and respondent's income and contribution to their family income.

Age distribution of the respondent and family members

Table 1 reveals that majority of the 'with credit' women 46.5% belong to the age group 26 to 35 years. On the other hand, most 33% 'without credit' women belong to age group 18 to 25 years. There are no respondents below 18 years from both of 'with credit' and 'without credit' rural women. About 47% of with credit rural women are between 26 to 35 years of age and 16% were between 18 to 25 years of age. On the other hand, 33% 'without credit' rural women are in the age bracket 18 to 25 years and about 31% are in the 26 to 35 years of age group. Only 0.5% 'with credit' women are above 56 years of age. On the other hand, there are no without credit sample above 56 years of age. Table 2 shows the age structure

Table 1. Age distribution of the respondents.

Age group (Years)	With credit		Without credit	
	No.	Percentage	No.	Percentage
18 - 25	32	16.0	33	33.0
26 - 35	93	46.5	31	31.0
36 - 45	59	29.5	28	28.0
46 - 55	15	7.5	8	8.0
≥56	1	0.5	0	0
Total	200	100.0	100	100.0

Source: Field survey (2008).

Table 2. Age distribution of the family members including respondents.

Age group (Years)	With credit		Without credit	
	No.	Percentage	No.	Percentage
< 7	122	16.97	110	25.64
8 -17	161	22.4	78	18.18
18 - 35	296	41.17	154	35.9
36 - 55	132	18.35	73	17.02
≥56	8	1.11	14	3.26
Total	719	100.0	429	100.0

structure of the family members including respondents. The members were grouped in to five age groups, viz. below 7, 8 to 17, 18 to 35, 36 to 55 and above 56 years. Most of the members of with credit and without credit families were in the same age group 18 to 35. About 23 and 17% of with credit and without credit respondents belong to age group 8 to 17 and 36 to 55 years. Family members of without credit respondents were roughly equal (about 17%) in the age group 8 to 17 years and 36 to 55 years. The members of with credit and without credit respondents were about 18 and 27% within the age group below to 7. About 4 and 5% of with credit and without credit respondents belong to age group 56 years above.

Educational status

To examine educational status of the 'with credit' and 'without credit' rural women, educational levels are divided in to six categories. These are (i) No schooling, (ii) Primary school, (iii) Secondary school certificate (SSC), (iv) Higher secondary certificate (H.S.C/College), (v) Graduate/University and (vi) Post graduate / Masters and above. Those who cannot sign, read and write are considered as no schooling, sometimes they can only sign. Those able to read, write and schooling up to class V were considered as primary, Class VI to Class X were secondary school certificate and above SSC called Higher secondary certificate or college. Those who are able to go to college are considered as Graduate/University and above to graduate called Post graduate

level education. Table 3 shows the educational levels of the 'with credit' and 'without credit' rural women.

There are 29.5% members among the 'with credit' sample While 59% of the 'without credit' sample are found to have no schooling. About 35% of with credit' and 28% of 'without credit' rural women are able to going primary school (Class I to V). 'With credit' and 'without credit' respondents are completing SSC (Class VI to Class X) constituted 26.5 and 13%, respectively. Only 9.5% of with credit women passed HSC. There was no HSC passed among without credit women. It is to be mentioned here that maximum 'with credit' rural women had the ability to go school. This had been possible because of the intervention of the GB. As institutional requirement the GB member are required to be able to write their names or be able to put signature. GB staff helped these members develop this ability. Panda (2009) found that the target households had 12.16% higher literate members as compared to that of the control households. Pitt and Khandoker (1996), Kabeer (2001) also found that credit programmes increase girl's schooling for female than for male borrowers. As a result, rural increased education among the rural woman.

Marital status

As far as the marital status of the respondents is concerned, it is found that in the with credit rural women, 94.5% are married and 5.5% are widow. On the other hand, 88% without credit women are married, 4% are divorced and 8% are widow (Table 4). There are no

Table 3. Educational status of the respondents.

Item	With credit		Without credit	
	No.	Percentage	No.	Percentage
No schooling	59	29.5	59	59.0
Primary school	69	34.5	28	28.0
Secondary school certificate	53	26.5	13	13.0
Higher secondary certificate	19	9.5	-	-
Graduate/university	-	-	-	-
Post graduate/masters	-	-	-	-
All	200	100.0	100	100.0

Source: Field Survey (2008).

Table 4. Marital status of the respondents.

Group	Married		Divorced		Widow		All	
	No	%	No.	%	No.	%	No.	%
With credit	189	94.5	-	-	11	5.5	200	100.0
Without credit	88	88.0	4	4.0	8	8.0	100	100.0
All groups	277	91.25	4	2.0	19	6.75	300	100.0

Source: Field Survey (2008).

Table 5. Occupational distribution of the respondent.

Occupation	With credit		Without credit	
	No.	Percentage	No.	Percentage
Private servant	4	2.0	1	1.0
Farmer	134	67.0	46	46.0
Housewife	4	2.0	31	31.0
Small business	54	27.0	7	7.0
Daily laborer	4	2.0	15	15.0
Total	200	100.0	100	100.0

Source: Field survey, 2008.

divorcee respondents among the 'with credit' women.

Occupational distribution

Most of the sample women in this study are found to have been dealing with many occupations such as farmer (agriculture), service, small business and daily laborer. Farmer includes all activities related to crop cultivation, livestock rearing, homestead gardening, etc. Small business such as bread, biscuit, chocolate, churi-dulphita selling to door to door and other suitable own business activities were considered as small business

activities.

The occupational statuses of the sample respondent's are presented in Table 5. It is found that majority of the 'with credit' (67%) and 'without credit' (46%) rural women were engaged in farmer (mainly agricultural) activities. Only 2% of 'with credit' and 1% of without credit rural women are private servant. About 2 and 31% of with credit and 'without credit' women are housewife. 'With credit' and 'without credit' rural women are engaged in small business, respectively 27 and 7%. It is also shown from this table that only 2% of the 'with credit' women reported that they are engaged in daily laborer. On the other hand, there are 15% daily laborer of 'without credit'

Table 6. Family size of 'with credit' and 'without credit' respondents.

Group	Family size
With credit	3.59
Without credit	4.29
All group	3.94

Source: Field survey (2008).

Table 7. Distribution of earning and dependent person.

Group	Earning person		Dependent person		Total
	No.	Percentage	No.	Percentage	
With credit	398 (1.99)	55.35	321 (1.60)	44.65	719 (3.59)
Without credit	159 (1.59)	37.06	270 (2.7)	62.94	429 (4.29)
All group	557	46.2	591	53.8	1148

Figures within parentheses indicate average. Source: Field survey (2008).

rural women.

Family size

Family size is an important factor for income and consumption. A family in the present study was defined as total number of persons living together and taking meals from the same kitchen. Person or persons of a family or some families who have been employed elsewhere outside the house but used to have meal from the same kitchen are considered as members of the same family. The term family, as used here, includes wife, sons, unmarried daughter, father, mother, etc. Table 6 shows that the average size of family of with credit and without credit women were 3.9 and 4.64 both of which were less than that of the same of the national family size of 4.8 (2006b). Family size of without credit rural women was slightly bigger than that of with credit rural women. (Family size = Total person of the family/total respondent.

Earning and dependent person

Table 7 shows that a family of 'with credit' rural women consisted of 55.35% of earning person and 44.65% of dependent person while a family of 'without credit' rural women consisted of 37.06% of earning person and 62.94% of dependent person. For 'with credit' rural women every earning person shares of his/her income with other is 0.80 that means an earning person has to bear the living expenses of almost other one person. For 'without credit' rural women every earning person shares his income with other is 1.67 that means an earning person has to bear the living expenses of almost other

two person. (Every earning person shares of his income with others = Rate of Dependent person / Rate of Earning person) (Mondal et al., 2009).

Respondent's income and contribution to the family income

Income is one of the most important indicators to measure socio-economic status of the people. Overall income of a family consists of total income from all family members. Table 8 shows that the monthly average income of 'with credit' and 'without credit' rural women are estimated TK 1870.00 (US\$ 27.6) and TK 540.00 (US\$ 7.9) which contributes about 19 and 10% of their average total family incomes, respectively. On the other hand, the monthly average incomes are estimated TK 6387.50 (US\$ 93.1) and TK 3988.00 (US\$ 58.1) from 'with credit' and 'without credit' respondents husband which comprising about 65 and 76% of their average total family incomes, respectively. Others sources (son, daughter, father, mother, etc) also contributes about 16 and 14% of the 'with credit' and 'without credit' respondent's total family income. The study showed that monthly average income of the 'with credit' respondent was much higher compared to the 'without credit' respondents. Therefore, the study used multiple regression analysis only for with credit rural women. Panda (2009) also found that the target households had registered 11.41% higher annual average income as compared to that of the control households. McKernan (2002) also revealed that participation in GB micro-credit programme increases average monthly profits from self-employment from about \$45 to about \$80. Therefore, it can be assumed that the higher income of the 'with credit'

Table 8. WC and WOC women's contribution to their family income.

Source of income	With credit		Without credit	
	Average* (Taka)	Percentage	Average (Taka)	Percentage
Respondent	1870.00 (US\$ 27.6)	19	540.00 (US\$ 7.9)	10
Husband	6387.50 (US\$ 93.1)	65	3988.00 (US\$ 58.1)	76
Others (son, daughter, father, mother etc)	1594.25 (US\$ 23.2)	16	750.00 (US\$ 11)	14
Total family income	9851.75 (US\$ 143.6)	100.0	5278.00 (US\$ 77)	100.0

*1 US\$ = Taka 68.62, during the period of data collection. Source: Field survey (2008).

respondents due to the outcome of the GB initiated group dynamics and skill development training, adequate and timely availability of credit for income generating and production activities.

Multiple regression model for determining factors of 'with credit' respondent's contribution to the total family income

The extent to which respondent's contribution to the total monthly family income increased is likely to depend on a number of variables for example; age of respondent, status of marriage, level of education, family member total, number of earning members, occupation of respondent, monthly income of husband and monthly income of respondents Table 9 provides an overview of the explanatory variables used in the multiple regression model of the study. Most of the variables derived from the survey and which have been considered relevant from theoretical point of view are included as explanatory variables. The estimated results of the multiple regression analysis on the respondent contribution to the family income data for the whole sample are summarised in Table 10. Overall, the estimated result is satisfactory because it fulfills the following criteria of good results. First, the adjusted R^2 (which is a measure of goodness of fit of the estimated regression model) value 0.784 depicts a good fitting of the model. In this model, the observed R value of 0.890(a), R^2 value of 0.793, and the F-test shows that the estimated regression is quite meaningful in the sense that the dependent variable is related to each specified explanatory variables.

The linear relation of the model is highly significant (the p value for the F is less than 0.0001). Second, the signs for the estimated coefficients are consistent with the theoretical or prior expectations. Thirdly, Most of the estimated coefficients are statistically significant at the 0.01 and 0.05 level, which is significantly different from zero. To identify the occurrence of multicollinearity, the correlation matrix of the explanatory variables is studied. The results of this multiple regression analysis show the best in the sense of involving no multicollinearity, that is ensuring no two independent variables has a correlation in excess of 0.80. This means that the independent

variables are not too highly related to each other. Moreover, this study employed the technique of collinearity diagnostics to eliminate the problem of multicollinearity. The estimated final multiple regression equation of the respondent's contribution to the total family income improved as follows:

$$Y = 3027.487 + 576.920 X_1 - 1339.285 X_2 + 139.494 X_3 + 8.552 X_4 + 206.890 X_5 \\ (3.212) \quad (3.446) \quad (-1.985) \quad (.994) \quad (0.096) \quad (1.221) \\ + 2207.569 X_6 + 0.743 X_7 + 1.130 X_8 \\ (1.993) \quad (24.417) \quad (5.283)$$

In the above equation figures in the parentheses are the t -values of the regression coefficients.

Table 10 shows that most of the explanatory variables are significantly related with the respondent's total family monthly income increases, which is indicated by the R^2 , adjusted R^2 and F -value. The explanatory factors that have a positive effect on the respondent's family incomes are age of respondent (X_1), level of education (X_3), family size (X_4), number of earning members (X_5), occupation of respondents (X_6) monthly income of husband (X_7) and monthly income of respondent (X_8). On the other hand, the factor such as marital status (X_2) has a negative effect on the family income. However, the overall result of this multiple regression analysis is strongly supported from the value of adjusted R^2 , which is significant at 0.01 level (F -test confirms the significance of R^2) measuring the goodness of fit of the model. The adjusted R^2 value of 0.784 for this model defines that 78% of the variation in change of with credit respondent's monthly income increased could be explained by the all independent variables in the model.

A variable of the age of respondent's (X_1) is considered in this model as an important determinant of the with credit respondent's family monthly income. The sign of its coefficient is found to be positive and highly significant ($P < 0.01$). The positive coefficient of X_1 at the 1% level of significance indicates that, irrespective of gender, age will have a significance influence on the respondent's family income increasing that people who are 26 to 35 years of age likely to make more income increases than people 36 to 45 years. Therefore, younger respondent's (20 to 40

Table 9. Descriptions of the variables in the multiple regression models.

Independent variable	Definition	Type of variable	Expected effect on income
Age	Age of respondent (X_1) 1 = 18 - 25 2 = 26 - 35 3 = 36 - 45 4 = 46 - 55	Ordinal categorical	+
Marriage	Marital status (X_2) 1 = Married 2 = Widow 3 = Divorce	Categorical	-
Education	Level of education (X_3) 0 = No schooling 1 = Primary 2 = SSC 3 = HSC 4 = Graduate 5 = Post graduate	Ordinal categorical	+
Member Earning	Total family members (X_4)	Continuous and quantitative	+
Occupation	Number of earning members (X_5)	Continuous and quantitative	+
	Occupation of respondent farmer (X_6) 1 = Farmer 0 = Others	Dichotomous	+
Husband income	Monthly income of husband (X_7)	Continuous and quantitative	+
Respondent income	Monthly income of respondent (X_8)	Continuous and quantitative	+

Table 10. Results of the multiple regression analysis for the determinants of respondent's family income (y is the maximum amount of total family income).

Variable	Estimated coefficient (β)	Standard error
Constant	3027.487 (3.212)**	942.678
Age of respondent (x_1)	576.920 (3.446)**	167.401
Status of marriage (x_2)	- 1339.285 (- 1.985)**	674.785
Level of education (x_3)	139.494 (.994) ^{NS}	140.307
Total family member (x_4)	8.552 (0.096) ^{NS}	88.744
Number of earning members (x_5)	206.890 (1.221) ^{NS}	169.432
Occupation of respondent farmer (x_6)	2207.569 (1.993)**	1107.637
Monthly income of husband (x_7)	.743 (24.417)***	0.030
Monthly income of respondent (x_8)	139.494 (.994) ^{NS}	0.214
Number of observation		200
Df of regression		8
R		0.890
R ²		0.793
Adjusted R ²		0.784
Standard error of the estimate		1857.258
Mean of dependent variable		9851.75
F-value		91.328
Durbin-Watson		2.050

Figures in parentheses denote the t-values of the regression coefficients. *** Indicate significant at 0.01 level. ** Indicate significant at 0.05 level. ^{NS} Indicates not significant at 0.10 levels.

years) were 4 times more likely to be members of informal financial groups than people who were older than 40 years (Fendru, 1995). In this model, respondent's status of marriage (X_2) as a regressor proves statistically significant ($P < 0.05$) and negatively affecting of the respondent's family income. The negative coefficient of X_2 at 5% level of significance indicates that respondents who were widowed, separated and divorced were more likely to retain control over loan use and savings money compared to the young, unmarried women and new brides (Goetz and Gupta, 1996). In this study found that 94.5% are married, 5.5% are widow and there are no divorcee respondents among the 'with credit' women (Table 4). Therefore, widows and divorces of their sons often turned over the money to them (Wakoko, 2003). However, it shows that widows and divorces are potentially inclined to contribute to increase family income. Respondent's level of education (X_3) shows a positive relation with the respondent's family income but do not have any significant effect on the respondent's family income. The positive coefficient shows that the respondent's have about 35, 27 and 10% primary, SSC and HSC education (Table 3). Therefore, respondents who have received formal education will be likely to make more income in their family than respondent's who have not received formal education. It can be indicate that the higher the education the higher is the family income of the women. The variable family members total (X_4) is shown to be statistically not significant and positively related to respondent's family income. However, the positive coefficient of X_4 indicates that a family size of (4 people or more) will have positive significant influence on the respondent's role in household income. Table 6 shows that the average size of family of 'with credit' rural women was 3.9 which is less than that of the national family size of 4.8 (BBS, 2006b).

The result is expectable because the most of the respondent's family size is higher average 3.9. In fact, family size greatly affects the type and number of income generating activities household members use, particularly borrowing and saving (Fendru, 1995). The determinant, variable of the respondent's family of the number of earning members (X_5) is proved to be statistically not significant and positively related to respondent's family income. If other factors remaining the same, the positive coefficient of X_5 shows that if the more earning members of the family, the amount of the respondent's family income also higher. In this study about 51% earning members of the family this means that this variable positively affected of the family income. The variable, occupation of respondent's farmer (X_6) as a determinant is statistically significant at 5% level and positively affected to the respondent's monthly income. Table 5 shows that more than half of respondent's occupation is farmer. Therefore, agricultural production is one of the main sources of income of the Non Governmental Organization (NGO) participant households. The variable

on the monthly income of respondent's husband (X_7) has a statistically significant and positive effect on the respondent's monthly income. When the other factors are constant, this finding indicates that if the monthly income of respondent's husband is higher, the family income also increases. This result seems reasonable since the husband's income frequently could have better understanding of the improved of the total family income. As the crucial determinant of total family income, the monthly income of respondent's (X_8) is considered in this model as an important determinant of the total monthly income of household.

The sign of its coefficient is found to be positive and highly significant ($P < 0.01$). The positive coefficient of X_8 at the 1% level of significance indicates that, the rural women who have access to the GB micro credit programmes loans received and savings those who participate in GB financial groups will have a significant increase in family income and agricultural production as well as incomes use activities, compared to women who do not have the participation of GB. Therefore, the positive coefficient shows that the GB has increased women's income and their contribution to overall family income. The "with credit" respondent indicated that after joining GB (getting loan, training, etc.) it was possible to undertake income generating activities. It was also observed that the social status of women had increased after involvement in income generating activities. Consequently, women could overcome social impediments. After earning money their status in the eyes of husband, members of the family, relatives and neighbors has gone up substantially, while in the past they (husband and members of the family) used to neglect them (Chowdhury and Naher, 1993). It is presumed that higher contribution in family income bring higher status, gender independence and more bargaining power within the household. So, it is also presumed that rural poor women's contribution to family income increases their involvement to the GB micro credit programme. As a result, GB proving microcredit programme to the poor has potential for improving women's socio-economic development and sustainable livelihood.

Conclusion

This study concludes that majority of the 'with credit' respondents showed higher percentage of education (schooling 34.5%, secondary 26.5% and higher secondary certificates 9.5%) and contributed much higher percentage (19%) of their incomes to the family compared to the 'without credit' respondents. It shows that the rural women, after joining the GB microcredit programme was inspired guided to undertake various socio-economic development activities. This income earning opportunity helped them to change the gender relation to some extent. Now, women's income constitutes a

significant source of family income that definitely benefited the family as a whole. Moreover, women's earning was needed for the survival of the poor family. It is shown that the 'with credit' rural women have improved their socio-economic status to be part in microcredit programmes of GB. Various studies show that the involvements of the rural women in home-based economic activities through micro credit programmes have positive socio-economic impact on their lives and their families (Afrin et al., 2008). In addition, GB is providing micro-credit to poor has great potential for improving women's socioeconomic status, increasing their empowerment and lifting their families out of poverty (Bernasek, 2003). Therefore, microcredit programme helps the rural poor women to be more independent and more financially solvent in their families.

ACKNOWLEDGEMENTS

The research study is supported from the Commonwealth Scholarship and Fellowship Plan (CSFP) in Ministry of Higher Education Malaysia. We are grateful to the all respondents for providing valuable informations and data. We are also thankful to the International Programme Department of GB and Branch Manager of Satmera Branch in Panchagarh, for their kind cooperation and permission to carry out the field works under their project areas.

REFERENCES

- Afrin S, Islam N, Ahmed SU (2008). A Multivariate Model of Micro Credit and Rural Women Entrepreneurship Development in Bangladesh. *Int. J. Bus. Manage.*, 3(8): 169-185.
- Ali MH (2008). Evaluation of Micro credit Operation in Bangladesh: A Critical Study on Grameen Bank. *Pak. J. Soc. Sci.* 5(9): 960-967.
- Australian Bureau of Statistics (2005). 2005 Year Book in Australia. Bangladesh Bureau of Statistics (BBS) (2006a) Statistical Yearbook of Bangladesh, 2006.
- BBS (2006b). Statistical Pocket Book. Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.
- Bernasek A (2003). Banking on Social Change: Grameen Bank Lending to Women. *Int. J. Polit., Culture Soc.*, 16(3): 369-385.
- Carson RT, Flores NE, Martin KM, Wright JL (1996). Contingent valuation and revealed preference methodologies: comparing the estimates for quasi-public goods. *Land Econ.*, 72: 80-99.
- Chowdhury PK, Naher NB (1993). Women Entrepreneurs of Rural Industries in Some Selected Areas. Comilla, BARD.
- Fendru I (1995). A Socioeconomic Study of Access to Rural Finance in Uganda. Ph.D. Dissertation. The Ohio State University.
- Goetz AM, Sen GR (1996). "Who Takes the Credit?" *World Dev.*, 24: 45-63.
- Grameen Bank (2009). Grameen Bank At a Glance (online accessed 12 August, 2009). http://www.grameen-info.org/bank/GB_Glance.htm.
- Grameen Bank Monthly Updates (2007). (Online accessed 10 September, 2007) <http://www.gfusa.org/grameenbank/II.htm>.
- Gujrati DN (2003). Basic Econometrics. McGraw-Hill Higher Education, United State Military Academy, West Point, USA.
- Islam N, Sultana N (2006). The Status of Women in Bangladesh: Is the Situation Really Encouraging? *Res. J. Soc. Sci.*, 1(1): 56-65.
- Kabeer N (2001). Conflicts over Credit: Reevaluating the Empowerment Potential of Loans to Woman in Rural Bangladesh. *World Development*, 29(1): 63-84.
- Larance LY (2001). 'Fostering Social Capital through NGO Design: Grameen Bank Membership in Bangladesh'. *J. Int. Soc. Work*, 44(1): 7-18.
- McKernan SM (2002). 'The Impact of Micro-Credit Programs on Self-Employment Profits: Do Non-Credit Program Aspects Matter?' *Rev. Econ. Stat.*, 84(1): 93-115.
- Mondal NI, Khan AR, Chakma J, Hossain G (2009). Family Structure, Economic Security and Educational Status of Rural Chakma in CHT of Bangladesh. *J. Soc. Sci.*, 19(3): 219-224.
- Newaz Ware (2007). Impact of NGO Programmes on Rural Women in Bangladesh. *Asian Affairs*, January-March 29(1): 5-40.
- Panda DK (2009). Participation in the Group Based Microfinance and its Impact on Rural Households: A Quasi-experimental Evidence from an Indian State. *Global J. Finance Manag.* 1(2): 171-183.
- Pitt M, Khandker S (1996). Household and intra-household impact of the Grameen Bank and similar targeted credit programs in Bangladesh. World Bank Discussion Paper No. 320. Washington, DC, The World Bank.
- Pitt M, Khandker SR (1998). The impact of group-based credit programs on poor households in Bangladesh: Does the gender of the participant matter? *J. Polit. Econ.*, 106: 958-96.
- Todd H (1996). Women at the Center: Grameen Bank Borrowers after one decade. The University Press Limited, Dhaka, Bangladesh.
- Wakoko MAF (2003). Microfinance and Women's Empowerment in Uganda: A Socioeconomic Approach. Ph.D. Dissertation. The Ohio State University.