

Contribution of Rural Women to Family Income Through Participation in Microcredit: An Empirical Analysis

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Abstract: Problem statement: Rural women in Bangladesh have a lower socio-economic status and very limited access to income generating activities due to a number of social, cultural and religious barriers. Consequently, they have less opportunity to contribute to their family income. Rural women are economically dependent and vulnerable and socially discriminated. Microcredit programme provides loans to the rural poor women in order to undertake small financial and business activities that allow them to generate income. This income earning opportunity helps the rural women to contribute to their family income and achieve a level of independence. **Approach:** In the present study, an attempt has been made to assess the impact of microcredit programme on rural women's contribution in improving the household income. The study is based on empirical data collected through interview from the two groups of rural women e.g. 'with credit' and 'without credit' rural women. The 'with credit' respondents represent the rural women who have taken loan from the Grameen Bank's microcredit programme. The results show that the proportion of the 'with credit' rural women who contributed to family income is much higher (19%) than that of 'without credit' rural women (10%). A multiple regression analysis was conducted to identify the factors influencing the respondent's contribution to the total monthly family income. **Results:** 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. It was also found that with 'credit rural' women have improved their socio-economic status and income generating activities by participating microcredit programmes of Grameen Bank. **Conclusion:** It is concluded that women can contribute to increase in family income which is essential for survival of the rural poor families. Therefore, the MFIs should create provision of credit for women to get them involved in income generation activities.

Key words: Rural women, regression model, microcredit programme, socio-economic status, income generating activities, economically dependent, Grameen Bank (GB), household income, marital status, Statistical Package for Social Science (SPSS)

INTRODUCTION

Bangladesh is a least developing country of which more than 80% people live in rural areas (Sultana *et al.*, 2010). Women constitute almost half of the total population of the country (Sultana *et al.*, 2010). But it is a matter of regret that rural women are economically dependent and vulnerable, educationally backward as well as politically and socially disadvantaged (Sarker and Rahman, 2007). Though, women are playing very important role in both at home and outside but still disparities exist between men and women in education,

health, employment and income opportunities, control over assets, personal security and participation in the political process (Hoque and Itohara, 2008). In this circumstance, microcredit programme has emerged as an important financial instrument to alleviate poverty in Bangladesh. With the intervention of microcredit programme, the rural women are coming outside the homestead to participate in various income-generating activities such as crop production, post-harvest activities, poultry rearing, the management of livestock and fisheries and so on (Hossain, 2010). For that reason, Microcredit program is a unique among the

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development interventions mainly because of its social transformational effects and ability to reach a diverse group of mass poor in rural areas (Dulal, 2007).

Income is the most important factor for human well being as well as the living standard, health status, social and political power (Mondal *et al.*, 2009). Microcredit programme creates income earning opportunities for rural poor women by providing small loans to them. With the loans provided, rural women engage themselves successfully in various income generating activities to earn money. They operate numerous small businesses and home-based productive activities to increase their income level. Rural women can use their increased income to meet up treatment expenses, improve quality of sanitation, pay their children's school fees and enhance the nutrition status of household members (Downs, 2007). They can also contribute to improve housing condition and accumulate assets needed for their families. By creating income earning opportunities for rural women, microcredit programme helps to increase total household income that improves the consumption patterns and livelihoods of the rural families (Haque and Yamao, 2009; Panda, 2009; Mondal *et al.*, 2009; Hoque and Itohara, 2009). In a study, Kuhinur and Rokonzaman (2009) found that small amounts of capital provided to the poor can make the difference between absolute poverty and thriving little business generating enough income to feed the family and improve housing, health and sanitation situation. Ali (2008) conducted a study on the microcredit programme of Grammen Bank (GB), one of the largest MFIs working in Bangladesh and found a significant contribution of GB's loans in increasing member's income and assets. The study revealed that income level of GB member families was 50% higher than the target group in the control village and 25% higher than the target group non-members in Grameen Bank villages. The study conducted by Hoque and Itohara (2009) reported that the absolute majority (97%) of the NGO women have direct contribution in household income compared to non-NGO women. This is obviously due to participation in micro credit programmes which create income opportunities for the rural women through small entrepreneurship development. Another study conducted by Hoque and Itohara (2008) also revealed that participation of rural women in microcredit programmes has increased their income and consequently contribution to their overall family income. The study conducted by Newaz (2007) reported that most women considered their present

practices regarding better nutrition, health care, girls schooling etc. as their contribution towards the family well-being which at times were identical to their own well-being. Thus, micro credit programme has significant impact on income and economic security on the socioeconomic lives of rural women (Afrin *et al.*, 2009).

This study shows how microcredit programme contributes to increasing household income. The study also compares sources of income generation between 'with credit' and 'without credit' rural women.

METERIAL AND METHODS

Survey design, sampling method, 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 (Ogunlade and Adebayo, 2009) 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 Pachagarh Districts with two groups ('with credit' and 'without credit') of rural women. In this study, sampling design was followed by "purposive random sampling" method. In the first stage of the survey and sampling, the study was purposively selected the samples of the rural women in the Panchagarh District. Then, the samples were divided into two groups i) with credit and ii) without credit rural women. Grameen Bank members are chosen for 'with credit' respondents. For the with credit samples, this study has selected 200 samples randomly from the listed (about 700) rural women of Grameen Bank members in the Pokhi Laga, Vetur gor, Chand para and Madhuban guchchho gram. For the 'without credit' samples, this study has selected 100 samples randomly from the total rural women (900) from the Goual para and Jamader para villages, who do not bear loan or credit. The data were collected by the researcher herself using a pre-tested interview schedule and the period was from 1st April 2008-30 June 2008.

Data analysis: 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 were used to analysis primary data for this study. This study utilized 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 'with credit' and 'without credit' respondent's contribution to the total family income.

In this study, a multiple regression model was used to determine the various demographic and socio-

economic factors that affect the contribution of 'with credit' and 'without credit' respondents to their total monthly family income. The model is as follows:

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

i.e.,

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

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))

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 into consideration all the existing family members' (such as respondent, husband, son, daughter, father, mother) 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 1-5, her educational score was taken as 1. If the respondent passed the final examination of class 6-10, her educational score was taken as 2 and if the respondent passed the final examination of class 10-12, 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 4-5.

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

Respondent's household income: Income is an important factor to determine individual's standard of living. Involvement of women in income earning activities is now substantially recognized as a crucial factor for family survival, especially in subsistence family. At the same time, many of their activities/work especially household chores that women carry out almost solely have neither been valued in financial terms nor adds fully to their status in the male female equation. Besides, these women are actively involved in pre and post harvest activities in the form of unpaid labor which would otherwise be beyond the capacity of the husband alone. Their works obviate the need for hiring and paying labor which the family budget cannot afford generally. Table 1 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) Per month 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' respondent's husband which comprising about 65% and 76% of their average total family incomes, respectively. Others sources (son, daughter, father, mother) also contributes about 16% and 14% of the 'with credit' and 'without credit' respondent's total family income.

Table 1: Sources of household income

Sources of income	With credit		Without credit	
	Average* (Taka)	(%)	Average (Taka)	(%)
Respondent	1870.00 (US\$ 27.6)	19.0	540.00 (US\$ 7.9)	10.0
Husband	6387.50 (US\$ 93.1)	65.0	3988.00 (US\$ 58.1)	76.0
Others (son, daughter, father, mother)	1594.25 (US\$ 23.2)	16.0	750.00 (US\$ 11)	14.0
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

Table 2: Description of the 'with credit' respondent variables in the multiple regression model

Independent variable	Definition	Type of variable	Expected effect on income
Age	Age of respondent (X ₁)	Ordinal categorical	+
	1 = 18-25 years		
	2 = 26-35 years		
	3 = 36-45 years		
	4 = 46-55 years		
Marriage	Status of Marriage (X ₂)	Categorical	-
	1 = Married		
	2 = Widow		
	3 = Divorce		
Education	Level of Education (X ₃)	Ordinal categorical	+
	0 = No schooling		
	1 = Primary		
	2 = SSC		
	3 = HSC		
	4 = Graduate		
	5 = Post Graduate		
Member	Total family members (X ₄)	Continuous and quantitative	+
Earning	Number of earning members (X ₅)	Continuous and quantitative	+
Occupation	Occupation of Respondent farmer (X ₆)		
	1 = farmer	Dichotomous	+
	0 = others		
Husband income	Monthly income of Husband (X ₇)	Continuous and quantitative	+
Respondent income	Monthly income of Respondent (X ₈)	Continuous and quantitative	+

The study showed that monthly average income of the 'with credit' respondent was much higher (71%) than that of the 'without credit' respondents. So, most of the women attributed this change to their perceived contribution as earner in the household income. Therefore, it can be assumed that the higher income of the 'with credit' respondents due to the outcome of the Grameen Bank initiated group dynamics and skill development training, adequate and timely availability of credit for income generating and production activities.

Determinants of 'with credit' and 'without 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, total family members, number of earning members, occupation of respondent, monthly income of husband and monthly income of respondents. Table 2-3 provide 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 'with credit' and 'without credit' respondents' contribution to the family income data for the whole sample are summarized in Table 4. Overall, the estimated result is satisfactory because it fulfills the following criteria of good results. First, the adjusted R² (which is the measure of goodness of fit of the estimated regression model) value of 0.784 depicts a good fitting of the model. In this model, the observed R value of 0.890(a), R² 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. Third, 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.

Table 3: Description of the 'without credit' respondent variables in the multiple regression model

Independent variable	Definition	Type of variable	Expected effect on income
Age	Age of respondent (X ₁) 1 = 18-25 years 2 = 26-35 years 3 = 36-45 years 4 = 46-55 years	Ordinal categorical	+
Marriage	Status of Marriage (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	Total family members (X ₄)	Continuous and quantitative	+
Earning	Number of earning members (X ₅)	Continuous and quantitative	+
Occupation	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 4: Results of the multiple regression analysis for the determinants of 'with credit' and 'without credit' respondent's family income (Y is the maximum amount of total family income)

Variables error	With credit		Without credit	
	Estimated coefficient (β)	Standard error	Estimated coefficient (β)	Standard error
Constant	3027.487	942.678	579.206	854.951
(3.212)**		(0.677) ^{NS}		
Age of Respondent (X ₁)	576.920	167.401	450.176	211.156
(3.446)**		(2.132)**		
Status of Marriage (X ₂)	-1339.285	674.785	615.538	301.997
(-1.985)**		(2.038)**		
Level of Education (X ₃)	139.494	140.307	138.877	250.405
(0.994) ^{NS}		(0.555)		
Total family member (X ₄)	8.552	88.744	159.520	163.915
(0.096) ^{NS}		(0.973) ^{NS}		
Number of earning members (X ₅)	206.890	169.432	93.298	337.872
(1.221) ^{NS}		(0.276) ^{NS}		
Occupation of Respondent famer (X ₆)	2207.569	1107.637	-66.181	339.959
(1.993)**		(-0.195) ^{NS}		
Monthly income of Husband (X ₇)	0.743	0.030	0.562	0.058
(24.417)***		(9.714)***		
Monthly income of Respondent (X ₈)	1.130	0.214	0.222	0.150
(5.283)***		(1.482) ^{NS}		
Number of Observation	200.000	100.000		
d.f. of Regression	8.000	8.000		
R	0.890	0.756		
R ²	0.793	0.572		
Adjusted R ²	0.784	0.534		
Standard Error of the Estimate	1857.258	1654.129		
Mean of Dependent Variable	9851.750	5278.000		
F-Value	91.328	15.174		
Durbin-Watson	2.050	1.831		

Note: 1. Figures in parentheses denote the t-values for the regression coefficients.2. *** Indicate significant at 0.01 level.3. ** Indicate significant at 0.05 level.4. ^{NS} Indicates not significant at 0.10 levels

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 'with credit' and 'without credit' respondent's contribution to the total family income improved as follows:

$$\begin{aligned}
 Y_{wc} &= 3027.487 + 576.920 X_1 - 1339.285 X_2 + 139.494 X_3 + 8.552 X_4 + 206.890 X_5 \\
 &(3.212) (3.446) (-1.985) (0.994) (0.096) (1.221) \\
 &+ 2207.569 X_6 + 0.743 X_7 + 1.130 X_8 \\
 &(1.993) (24.417) (5.283) \\
 Y_{woc} &= 579.206 + 450.176 X_1 + 615.538 X_2 + 138.877 X_3 + 159.520 X_4 + 93.298 X_5 \\
 &(0.677) (2.132) (2.038) (0.555) (0.973) (0.276) \\
 &-66.181 X_6 + 0.562 X_7 + 0.222 X_8 \\
 &(-0.195) (9.714) (1.482)
 \end{aligned}$$

In the above equation figures in the parentheses are the t-values of the regression coefficients and Y_{wc} and Y_{woc} depicts total family income for 'with credit' and 'without credit' respondents respectively.

Table 4 shows that most of the explanatory variables are significantly related with the GB 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 status of marriage (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 family income increased could be explained by the all independent variables in the model.

Table 4 also shows that most of the explanatory variables for 'without credit' respondents are not significantly than the 'with credit' respondent's, 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), status of marriage (X_2), level of education (X_3), family size (X_4), number of earning members (X_5), monthly income of husband (X_7) and monthly income of respondent (X_8). On the other hand, the factor such as occupation of respondent (X_6) has a negative effect on the family income. However, the adjusted R^2 value of 0.534 for this model defines that 53% of the

variation in change of 'without credit' respondent's family income increased could be explained by the all independent variables in the model.

The variable of the age of respondent's (X_1) is considered in this model as an important determinant of 'with credit' respondent's monthly family 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 significant influence on increase of the respondent's family income that people who are 26-35 years of age likely to earn more income than people of 36-45 years do. The study conducted by Rahman *et al.* (2009) found that as age of both male and female increases, income of the household increases; but after a certain level, it starts dropping. This is a realistic finding as in real life people's income increases as they grow older but falls after a certain level when they stop working. Similarly, the variable of age for 'without credit' respondent's (X_1) is also positive and significant ($p < 0.05$).

In this model, 'with credit' respondent's status of marriage (X_2) as a regress proves statistically significant ($p < 0.05$) and affecting negatively 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. Afrin *et al.* (2009) also found that most of the members of microcredit programme are married women. They contribute in their household income through participating in various economic activities (Hoque and Itohara, 2008). However, it shows that widows and divorcees are potentially inclined to contribute to increase family income. On the other hand, 'without credit' respondent's status of marriage (X_2) also statistically significant ($p < 0.05$) and positively affecting of the respondent's family income.

'With credit' and 'without credit' 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. 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 higher the education the higher is the family income of the women.

The variable of family size (X_4) is shown to be statistically not significant and positively related to 'with credit' and 'without credit' 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. Rahman *et al.* (2009) observed almost the similar findings on their study. They reported that households with more adult males contribute to increase assets of the family through income generation. However, the big family size creates more demand for basic needs e.g. food, health, shelter, education and other facilities. But the income of poor families is low and insufficient to meet the basic needs of the household. Consequently, it becomes difficult for the poor to support and maintain a large family.

The determinant, variable of 'with credit' and 'without credit' 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.

The variable, occupation of 'with credit' respondent's farmer (X_6) as a determinant is statistically significant at 5% level and positively affected to the respondent's monthly income. On the other hand, the variable, occupation of 'without credit' respondent's farmer (X_6) as a determinant is statistically not significant and negatively affected to the respondent's monthly income.

The variable on the monthly income of 'with credit' and 'without credit' respondent's husband (X_7) has a statistically significant and positive effect on the respondent's monthly income. When the other factors constant, this finding indicates that if the respondent's husband monthly incomes 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 'with credit 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 Grameen Bank microcredit 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 don't have the participation of Grameen Bank. On the other hand, the monthly income of 'without credit' respondent's (X_8) has a statistically not significant and positive effect on the respondent's family income.

Therefore, 'with credit' respondent's income highly significant and positive coefficient shows that the Grameen Bank has increased women's income and their contribution to overall family income. The 'with credit' respondent indicated that after joining Grameen Bank (getting loan, training) 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 neighbours has gone up substantially, while in the past their contribution to the family had always been neglected (Islam and Sultana, 2006). It is presumed that higher contribution of the women in family income brings higher status, gender independence and more bargaining power for them within the household. So, it can be concluded that rural poor women's contribution to family income increases through their involvement to the Grameen Bank's microcredit programme. Therefore, Grameen Bank providing microcredit programme to the poor has potential for improving women's socio-economic development and sustainable livelihood.

CONCLUSION

The study shows that microcredit program has a significant impact on income generation and sources of the socioeconomic livelihoods of rural women. The microcredit increases income of the rural poor women and helps them to spend more for the development of their lives and families. The present study shows that the proportion of the 'with credit' rural women who contributed to family income is much higher (19%) than that of 'without credit' rural women (10%). The study also reveals that the monthly family income of 'with credit' respondents was, on average, Taka 9851.75 compared to the 'without credit' families, on average, Taka 5278.00 (almost half of the 'with credit' family's monthly income). The findings of the study suggest that the rural women, after joining the Grameen Bank's microcredit program were inspired and guided more to undertake various income generating activities and sources. It is shown that Grameen Bank's microcredit program provides opportunities of income generation that help to improve rural women family income as well as their livelihood. Therefore, it can be concluded that microcredit program helps the rural poor women to be economically independent and financially solvent in their society.

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