

## Impact of Microcredit Program on Poverty Alleviation in Sylhet: An Approach to Targeting Women

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### Abstract

*Microcredit programs have become an increasingly important component of women development strategies to create employment, reduce poverty or promote micro entrepreneurial development. These credit programs are mostly on targeted groups of women, because most of the poor women are credit worthy as their repayment rates nearly reach hundred percent. Improved access to credit by women could lead to two developments: increased employment in income-generating activities and an incentive to adopt improved technology. The role of women could be enhanced if their resource base were expanded by the addition of complementary resources. From this aspect, credit becomes important because when women had improved access to credit they could expand their “expenditure savings” activities into “income-generating” ones and in the process improve their livelihood and economic status in society and contribute to alleviating their poverty.*

### Introduction

Microcredit programs give a better chance to alleviate poverty in Bangladesh, but the result may not come fast. The higher rate of economic growth in a country will

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give the poor people a better chance to show the real power of microcredit in changing their lives. Therefore, the microcredit programs have been developed with an aim to provide credit facility to the poor. The development of micro-enterprises through poor women by channeling cash in the family, which improves their position and bargaining edge in the household, will raise women's empowerment, which is a recognized means to alleviate poverty. If women had opportunities for gainful work outside the household, it would make their contribution to the household more visible, and concurrently reduce their economic dependence on their husbands.

Among various targeted poverty reduction programs that were being executed by the government, the Integrated Rural Development Program (IRDP), which preceded the BRDB, started organizing cooperatives for landless men Bittahin Samabay Samity (BSS) and women Mohila Bittahin Samabay Samity (MBSS) in 1974 as one of the main thrusts of its poverty alleviation program (Commonwealth Secretariat, 1992).

A major goal of self employment analysis is to highlight the role of credit programs in improving women's economic participation. A large proportion of the credit provided by these programs goes to poor women, which aims to increase their employment and productivity (Khandker and Khalily, 1994). The poor people need money for their survival and as a result of it they become the part of the vicious circle of poverty where at one time they approach the moneylenders and at other times to formal financial institutions. Microfinance is a middle path in which poor people can mobilize their savings, link it with credit, and finally become self-employed (Singh, 2003).

### **Objectives**

This is a comparative study in nature and its main objectives are:

- To identify the socio-economic conditions of women of different microcredit programs; and
- To assess the impact of microcredit programs on poverty alleviation of women at household level.

### **Methodology**

Selection of the sample and study area is an important step for the research work. The study area was selected purposively and all of the participants were selected

randomly. The study was conducted upon five different microcredit programs namely: ASA, BRAC, BRDB, GB and FIVDB existing in different areas (Akhalia, Sheikhghat, Nathpara, Mirbukshatula and Tukerbazar) in Sylhet. Data were collected from primary source for the study. The primary data were collected through sample survey techniques. A comparative study was performed to assess the impact of microcredit programs on poverty alleviation of women at household level, under five microcredit programming areas. For this study, a total sample size of 150 respondents (among a total of 530 respondents) were selected on random basis, of which 30 respondents were interviewed (out of 80) from the BRDB's microcredit program areas, 30 respondents (out of 100) from the ASA, another 30 (out of 150) from the BRAC, 30 (out of 100) from the GB, and another 30 (out of 100) respondents from the FIVDB were selected for this purpose. Out of the total sample of 150, 15 respondents were reluctant to make the desired response about their poverty status and were therefore excluded from the total sample. So, for purpose of the study the total sample size is 135.

### **Analytical Technique**

The study used both univariate and multivariate techniques to explore the poverty alleviation scenario. The univariate technique was used first to study the variation of poverty alleviation on several covariates. The multivariate technique viz., multiple logistic regression models, was used to identify the determinants of poverty alleviation. The reason behind the use of logistic regression model is that the outcome variable - poverty alleviation – is dichotomous in nature. Such model is helpful to predict the probability of selected microcredit programs to achieve success in alleviating poverty of women at household level.

### **Multiple Logistic Regression Model**

Multiple regression analysis is the most widely used technique when the dependent and independent variables are measured in interval scale under the assumption that they are normally distributed with equal variances. The logistic regression model can be used not only to identify risk factors but also to predict the probability of success. This model expresses a qualitative dependent variable as a function of several independent variables - both qualitative and quantitative (Fox, 1984).

Let  $Y_i$  denote the dichotomous outcome variable (dependent variable) for the  $i$ -th observation and

$$Y_i = y_i = 1, \text{ if the } i\text{-th individual is success to alleviate poverty}$$

$$= 0, \text{ if the } i\text{-th individual is a failure}$$

In order to give a simple notation, we use the quantity  $\pi(x) = E(y_i | x)$  to represent the conditional mean of Y given X when the logistic distribution is used. The method is to model the response using the logistic function given by

$$\pi(x_i) = \frac{e^{\hat{\alpha}_0 + \hat{\alpha}_1 X_i}}{1 + e^{\beta_0 + \beta_1 X_i}} \text{-----(1)}$$

where,  $X_i$  is an explanatory variable and  $\beta_i$ 's are the regression coefficients.

$$E(y_i = 1 | X_i) = \pi(X_i) = \frac{e^{\beta_0 + \beta_1 X_i}}{1 + e^{\beta_0 + \beta_1 X_i}} \text{-----(2)}$$

$$\text{and } E(y_i = 0 | X_i) = 1 - \pi(X_i) = \frac{1}{1 + e^{\beta_0 + \beta_1 X_i}} \text{-----(3)}$$

Therefore, we can write

$$\frac{\pi(X_i)}{1 - \pi(X_i)} = e^{\beta_0 + \beta_1 X_i} \text{-----(4)}$$

Now if we take natural logarithm of the equation (4), we get

$$L_i = \log_e \left[ \frac{\pi(X_i)}{1 - \pi(X_i)} \right] = \beta_0 + \beta_1 X_i \text{-----(5)}$$

The equation (5) is known as simple logit regression model.  $\frac{\pi(X_i)}{1 - \pi(X_i)}$  Here given in (4) is simply the odds ratio and the term  $L_i$  given in (5) is known as log-odds.

**Interpretation of the Parameters**

Since the logit transformation,  $L_i = \log_e \left( \frac{\pi_i}{1 - \pi_i} \right)$ , is linear in parameters, we can interpret the parameters using arguments of linear regression. Thus, the interpretation may be described as follows:

$$\text{We have, } \pi_i = \frac{e^{\beta_0 + \beta_1 x_1 + \dots + \beta_k x_k}}{1 + e^{\beta_0 + \beta_1 x_1 + \dots + \beta_k x_k}} \text{ is linear in parameter}$$

So, as in the case of linear regression model we can say that  $\beta_j (j = 1, 2, \dots, k)$  represents the rate of change in  $\log_e \left( \frac{p_i}{1 - p_i} \right)$  for one unit change in  $X_j$ , other variables remaining constant.

The interpretation of the parameters in logistic regression has another interesting aspect when the explanatory variable is qualitative. To describe this, we first consider that the independent variable ( $X_j$ ) is dichotomous. The description is given below:

We have 
$$\text{Log}_e \left( \frac{\pi_i}{1-\pi_i} \right) = \beta_0 + \beta_1 X_1 + \dots + \beta_j X_j + \dots + \beta_k X_k$$

Now if  $X_j$  is a dichotomous variable taking values 0 and 1, then the odds ratio ‘OR’ (say) for  $X_j=1$  against  $X_j=0$  (keeping all other  $X_i$ ’s fixed)

$$\text{OR} = \frac{p_i(y_i = 1 | x, x_j = 1) / \{-p_i(y_i = 1 | x, x_j = 1)\}}{p_i(y_i = 1 | x, x_j = 0) / \{-p_i(y_i = 1 | x, x_j = 0)\}} = \frac{e^{\beta_0 + \beta_1 X_1 + \dots + 1 \cdot \beta_j + \dots + \beta_k X_k}}{e^{\beta_0 + \beta_1 X_1 + \dots + 0 \cdot \beta_j + \dots + \beta_k X_k}}$$

$$= e^{\beta_j}$$

$\Rightarrow \log \text{OR} = \beta_j$

So, we can directly estimate the coefficients of a logistic regression model as log of odds ratio (OR) and hence can interpret. If a qualitative independent variable has m categories, we introduce (m-1) dummy variables and the remaining one is taken as reference category.

**Study Variables**

Dependent Variable with Categories

Name of the dependent variable	Category
Poverty Alleviation	1 = ‘yes’ 0 = ‘no’

**Results and Discussions**

**Differentials of Poverty Alleviation**

**Poverty Alleviation by Microcredit Organization:** Table 1 presents the poverty alleviation scenario according to the organization that provided credit to the women under five different microcredit programs in the study area. It is observed from the study that providing microcredit facilities in the study areas was not fruitful up to the mark.

## List of Independent Variables with Categories

Name of the Independent variables	Category
Total Members (in number)	1= '1-5' 2= '6-7'
Earning Members (in number)	1= '1' 2= '2' 3= '3'
Monthly Income (in Tk.)	1= '<6000' 2= '?6000'
Education	1= 'Illiterate' 2= 'Educated' 3= 'Higher Educated'
Occupation	1= 'Unemployed' 2= 'Employed'
Amount of Loan (in Tk.)	1= '<5000' 2= '5000-15000' 3= '>15000'
Savings Amount (in Tk.)	1= '<5000' 2= '?5000'

Table 1 : Poverty Alleviation Situation on the Basis of Microcredit Organization

Name of the Organization	Status of Poverty Alleviation		Total
	No	Yes	
ASA	19(67.9)	9(32.1)	28
BRAC	19(70.4)	8(29.6)	27
BRDB	21(84.0)	4(16.0)	25
GB	18(72.0)	7(28.0)	25
FIVDB	23(76.7)	7(23.3)	30
Total	100(74.1)	35(25.9)	135

Note: Figures in the parentheses indicate percentage

Source: Field Survey, 2008

**Poverty Alleviation by Household Members:** It is observed that the large families failed (80 percent) to bring poverty alleviation after receiving the loan from the microcredit organization in comparison with small families (Table 2).

**Poverty Alleviation by Household Earning Members:** Table 3 indicates the status of poverty alleviation for the selected households according to their earning

Table 2 : Status of Poverty Alleviation according to Household Members

Total HH Member (in number)	Status of Poverty Alleviation		Total
	No	Yes	
1-5	55(69.6)	24(30.4)	79
6-7	45(80.4)	11(19.6)	56
Total	100(74.1)	35(25.9)	135

Note: Figures in the parentheses indicate percentage

Source: Field Survey, 2008

members. The result indicates that microcredit programs did not have any significant impact on poverty alleviation.

Table 3 : Status of Poverty Alleviation according to Household Earning

HH Earning Member (in Number)	Status of Poverty Alleviation		Total
	No	Yes	
1	64(75.3)	21(24.7)	85
2	30(73.2)	11(26.8)	41
3	6(66.7)	3(33.3)	9
Total	100(74.1)	35(25.9)	135

Note: Figures in the parentheses indicate percentage

Source: Field Survey, 2008

**Poverty Alleviation by Household Monthly Income:** The impact of household's high monthly income on alleviation of poverty of poor women is depicted in Table 4. The Table shows that higher income of household has a better chance of success in poverty alleviation.

Table 4 : Household s Monthly Income to Alleviate Poverty

Monthly Income (in Tk.)	Status of Poverty Alleviation		Total
	No	Yes	
< 6000	35(79.5)	9(20.5)	44
? 6000	65(71.4)	30(28.6)	91
Total	100(74.1)	35(25.9)	135

Note: Figures in the parentheses indicate percentage

Source: Field Survey, 2008

**Poverty Alleviation by Women Education:** Table 5 shows that women with higher education status, if they have access to credit, can have highest success in poverty alleviation.

Table 5 : Education Status of Women to Alleviate Poverty

Education Status of Respondents	Status of Poverty Alleviation		Total
	No	Yes	
Illiterate	39(73.6)	14(26.4)	53
Educated	55(76.4)	17(23.6)	72
Higher Educated	6(60.0)	4(40.0)	10
Total	100(74.1)	35(25.9)	135

Note: Figures in the parentheses indicate percentage

Source: Field Survey, 2008

**Poverty Alleviation by Occupation of Women:** Microcredit organizations provide credit to women to raise their status through independent income generation and thereby alleviate poverty. Table 6 indicates that the microcredit facility given to the employed women was more effective in poverty alleviation than unemployed women.

Table 6 : Occupation Status of Women to Alleviate Poverty

Occupation	Status of Poverty Alleviation		Total
	No	Yes	
Unemployed	73(75.3)	24(24.7)	97
Employed	27(71.1)	11(28.9)	38
Total	100(74.1)	35(25.9)	135

Note: Figures in the parentheses indicate percentage

Source: Field Survey, 2008

**Poverty Alleviation the size of the Loan:** Table 7 shows that women who received larger amount of loan from any microcredit program could alleviate their poverty more than those women that received lower amount of loan.

Table 7 : Status of Poverty Alleviation according to the Amount of Loan Received

Amount of Loan (in Tk.)	Status of Poverty Alleviation		Total
	No	Yes	
<5000	22(81.5)	5(18.5)	27
5000-15000	68(73.9)	24(26.1)	92
> 15000	10(62.5)	6(37.5)	16
Total	100(74.1)	35(25.9)	135

Note: Figures in the parentheses indicate percentage

Source: Field Survey, 2008

**Poverty Alleviation by Amount of Savings:** Female borrowers want to accumulate savings in their own names, and microcredit programs enable them to realize this objective. So, larger savings amount contributes more to alleviate poverty of women (Table 8).

Table 8 : Savings Amount of Women to Alleviate Poverty

Savings Amount (in Tk.)	Status of Poverty Alleviation		Total
	No	Yes	
<5000	88(75.9)	28(24.1)	116
?5000	12(63.2)	7(36.8)	19
Total	100(74.1)	35(25.9)	135

*Note: Figures in the parentheses indicate percentage*

*Source: Field Survey, 2008*

### Determinants of Poverty Alleviation

The logistic regression model seems to be the most appropriate multivariate technique to explain the situation since the dependent variable - poverty alleviation, is binary. Therefore, the study develops a multiple linear logistic regression model by considering household members, earning members, monthly income, education and occupation of respondents, amount of loan, and savings amount as explanatory variables.

The result of the logistic regression model is shown in Table 9. Total household members of women borrowers influence their level of poverty. The number of household members is negatively related with the dependent variable. The relationship between probability and odds ratio is shown in the footnote<sup>3</sup>.

Household earning members is another important determinant of poverty alleviation. The households with more earning members reduce poverty through their income more than the households having fewer earning members.

The economic well being of women borrowers is largely determined by their household's monthly income. The success of poverty alleviation was 66.81 percent for the households with monthly income above Tk.6000, which is higher in comparison to the households with monthly income less than Tk.6000.

Educational status plays a vital role to alleviate poverty of women. Though the impact on poverty reduction was found almost the same for the employed and

<sup>3</sup> Probability = [Odds / (1+Odds)]

unemployed women, the success of poverty alleviation is higher for employed women than the unemployed ones.

Amount of loan is another factor that influences poverty alleviation. The reason is that a woman having a large sum of loan can properly utilize the loan for poverty alleviation.

Microcredit programs positively influence borrowers' ability to save, which can help them in times of emergency or other needs. So, it can be said that women that have larger amount of saving have greater ability to alleviate poverty and reduce their vulnerability at the household level.

### **Overall Interpretation**

From the results of the study it is observed that households with too many members have a negative effect on poverty alleviation, while the larger number of household earning members has a positive effect on poverty alleviation. The results also suggest that women's higher education status, employment opportunity, and monthly income of their household have the greatest positive impact on poverty alleviation. For example: the higher education level of women as opposed to lower level of education or illiteracy of women has a greater impact on their poverty alleviation. Our results also suggest that a larger amount of loan received and accumulation of savings of the poor women will be more effective to alleviate poverty.

### **Conclusion**

The present discussion on the credit activities of government and non-government microcredit programs reveals that disbursement of credit of these organizations was not much effective to alleviate poverty of poor women at household level. Some policy recommendations are made in this paper to the microcredit organizations for extending microcredit facility to poor women borrowers to alleviate their poverty.

Table 9 : Determinants of Poverty Alleviation: Logistic Regression

Variables	B	Standard Error	Wald	Odds Ratio
<b>Household Members</b>				
1-5 <sup>RC</sup>	-	-	-	1.000
6-7	-1.100	.485	5.144	.333**
<b>Household Earning Members</b>				
1 <sup>RC</sup>	-	-	-	1.000
2	.346	.547	.399	1.413
3	.531	.849	.391	1.700
<b>Household Income (in Tk.)</b>				
< 6000 <sup>RC</sup>	-	-	-	1.000
? 6000	.700	.493	2.017	2.013
<b>Education</b>				
Illiterate <sup>RC</sup>	-	-	-	1.000
Educated	-.297	.452	.432	.743
Higher Educated	.427	.788	.293	1.533
<b>Occupation</b>				
Unemployed <sup>RC</sup>	-	-	-	1.000
Employed	.070	.540	.017	1.073
<b>Loan (in Tk.)</b>				
<5000 <sup>RC</sup>	-	-	-	1.000
5000-15000	.320	.598	.286	1.377
>15000	.695	.792	.770	2.004
<b>Savings (in Tk.)</b>				
<5000 <sup>RC</sup>	-	-	-	1.000
?5000	.876	.611	2.057	2.401
Constant	-1.612	.617	6.820	.200

Source: Field Survey, 2008

Note: 1.RC: Reference Category

2. \*\*= $p < 0.05$ .

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