Bangladesh J. Agric. Econs. XXXV; 1&2 (2012) 115-130

IMPACT OF MICRO-CREDIT PROGRAMMES ON POVERTY ALLEVIATION IN BANGLADESH*

Mst. Asma Khatun[1]
Mohammad Amirul Islam
Shankar Majumder

Abstract

This present study examines the impact of micro-credit programmes of six government organisations (GO), non-government organisations (NGO) and micro-finance institutes (MFI) on poverty alleviation in Bangladesh using a purposive sample of 406 credit receivers. Alongside respondent's perceived change in poverty situation this study devised an alternative measure of poverty change based on the change in household wealth and education of a household. Two-level binary logistic regression and multinomial logistic regression analyses suggest that amount of loan, different GO /NGOs/MFIs, satisfaction level, taken loan before and micro-credit as main means of asset change were the determinants of change in poverty situation. Significant community level variation was found in this analysis which indicates that the respondents from different communities with same set of characteristics will exhibit different influences on the change in poverty situation. Further research should be carried out to identify the sources of such variation to optimise the effect of micro-credit.

I. INTRODUCTION

Poverty in Bangladesh is a multi-faceted problem involving income, consumption, nutrition, health, education, housing, crisis coping, insecurity, isolation, gender inequality, population growth, etc. In Bangladesh, per capita annual income in 2010 was estimated US$1,700 (adjusted by purchasing power parity) (CIA World Fact Book, 2011). Bangladesh remains one of the poorest, most densely populated and developing nations especially characterized by pervasive poverty in both rural and urban areas. The poverty extent is possibly more alarming in rural areas where problems of inequality and unemployment are growing rapidly.

In Bangladesh, poverty scenario was first surveyed in 1973-1974. The survey method was Household Income and Expenditure survey (HIES). In HIES, Food Intake and Direct Calorie Intake method were used. Daily per capita 2122 k calorie and 1805 k calorie were respectively as relative and hardcore poverty. According to HIES, poverty head count ratio was 58.8 percent in 1991-92, which has been

---

* *The paper is adapted from MS thesis of the first author (Khatun, M.A.).*
[1] *The first author is an Assistant Professor, Department of Agricultural Statistics, Sylhet Agricultural University, Sylhet. The second and third authors are Professors, Department of Agricultural Statistics, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh.*

reduced to 49.8 percent in 2000. Other indices such as poverty gap index (PGI) and squared poverty gap index (SPGI) are also reduced in national, rural and urban levels. In terms of the upper poverty line based on calorie intake, 41.2 million in rural areas and 14.8 million in urban areas were poor in 2005. The numbers of hardcore poor was 18.7 million in rural areas and 8.3 million in urban areas in 2005 (BBS, 2005). However, the situation has been improving over the years. According to the findings from household income and expenditure survey 2010, 31.5 percent of the population in Bangladesh remained below the poverty line (BBS, 2011). There are significant regional variations of poverty in Bangladesh. A study by Sen (2003) revealed that Rajshahi has the highest rate of poverty; 61 percent in contrast to Barisal, which has 40 percent only.

Under these circumstances, provision of micro-credit among the poor, both in rural and in urban areas, has been considered globally as an economic and social mechanism for self-employment with a view to increasing their income and improving their living condition. According to the Microcredit Regulatory Authority the total number of clients in this sector is 35 million with total outstanding loan around Tk. 248 billion (Microcredit Regulatory Authority, 2013). In the year 2010, 31.5 percent of the population in Bangladesh retained below the poverty line (BBS, 2011). In Bangladesh, now-a-days, there are a lot of national, international as well as local NGOs/MFIs that have been dealing with micro-credit programmes. Different organisations operate their programmes differently and with varying interest rates. Furthermore, there are increasing debates on micro-credit programmes.

A variety of studies have found a few key strengths and positive impacts produced by the implementation of microfinance programmes in poor and impoverished areas of the world. Some studies have found positive impact on living standards. For example, microfinance programmes have been regarded as an effective way to provide low-cost financial services to poor individuals and families (Miller and Martinez, 2006; Stephens and Tazi, 2006). Some studies have directly assessed the impact of micro-credit on poverty such as Hossain (1984), Hossain (1988), Akter (1996), Hashemi *et al*. (1996), Humal and Mosley (1996), Khandker and Chowdhury (1996), Ghosh (1997), Khandker (1998), Islam (1999), Uddin (2000), Jehangir *et al.* (2002), Pallavi and Ramakumar (2002), Khandker (2003), Alam (2005), Jalil (2005), Madhura (2007), Islam (2009). Adjei et al. (2009) found significant impact of microcredit on wealth and education in Ghana. Parveen and Chaudhury (2009) analyzed rural women's economic empowerment as the outcome of micro-credit interventions. Pitt *et al.* (2003) found that credit going to females has a large and significant impact on health measures for children.

Some other studies found that poverty is not reduced through micro-credit. Poor households become poorer through the additional burden of debt. For example, some studies have shown that the microfinance programmes benefitted the moderately poor more than the hardcore poor, and the impact of micro-credit

varied by income group (Copestake *et al*., 2001, Morduch, 1998; Dugger, 2004). Coleman (2001) found that programmes were not reaching the poor as much as they reach relatively wealthy people. Buckland (1996) found that the NGOs worked with a poor section of the population although not from the poorest section.

The empirical analyses regarding the impact of micro-credit on poverty are very mixed in terms of methodological approaches which is reflected from many studies conducted by Proshika (1995), Khandker and Chowdhury (1996), Mustafa *et al*. (1996), Sebstad and Chen (1996), Bruntrup *et al.* (1997), Edgecomb and Barton (1998), Morduch (1999), Schrieder and Sharma (1999), Copestake *et al*. (2001), Westover (2008) and Imai and Azam (2010). Some studies like Bruntrup *et al*. (1997) have only used descriptive statistics for analysis. They have not used multivariate technique to determine the impact of micro-credit on poverty and poverty related aspects of borrowing households. The study like Mustafa *et al*. (1996) was biased in selecting the sample household. Khandker and Chowdhury (1996) and Pitt and Khandker (1996) were found to be more sound from the methodological perspective.

In these circumstances, it is necessary to evaluate the performance of the micro-credit programmes in alleviating the poverty situation in Bangladesh. Moreover, the clients from different communities with similar set of characteristics may experience the impact of micro-credit differently due to the presence of some community effect, which should be addressed (using multi-level modelling). The present study aims to explore the impact of micro-credit programmes of six organisations, namely Association for Social Advancement (ASA), Bangladesh Rural Advancement Committee (BRAC), Grameen Bank (GB), Society for Social Service (SSS), PROSHIKA (an acronym of three Bangla words, which stand for training, education and action) and Thengamara Mohila Sabuj Sangha (TMSS) on poverty alleviation in Bangladesh.

The specific objectives of this study are to i) identify the poverty situations in which the micro-credit clients belong, ii) devise a suitable method for measuring the change in poverty situation, iii) test if micro-credit programmes have any significant effect on poverty alleviation and iv) evaluate the relative performances of organisations offering micro-credit in alleviating poverty.

II. DATA AND METHODOLOGY

(a) Data collection

This paper is based on the data collected under a small project grant of Bangladesh Agricultural University Research System, Bangladesh Agricultural University, Mymensingh. The research adopted purposive sampling technique. At first six micro-credit offering organisations namely ASA, BRAC, GB, PROSHIKA, SSS and TMSS were selected purposively then eight districts namely Dhaka, Mymensingh, Sherpur, Netrokona, Kishoreganj, Sylhet, Lalmonirhat and

Narsingdi were selected purposively for data collection. Note that no prior ranking was considered for the selection of organisations and districts. It was assumed that the micro-credit programme under same organisation is same in different areas and clients under same organisations were homogenous in terms of programme structure, e.g., interest rate, number of instalments for a certain range of loan. Hence, it was expected that findings may be more or less comparable with a national level study of such kind. From the eight targeted districts, twenty-six villages (where at least one of the selected organisations operates) were selected purposively and among these villages, 406 micro-credit clients were chosen randomly for the present study. It is to be noted that the sampling technique as being purposive in nature the determination of sample size was not based on the population size. Rather it was considered on the basis of a reasonable size that would allow complicated modelling practices (around 400). Data collected in this study are hierarchical in nature where individuals are nested into villages (sharing common contextual variables) and villages are nested into districts. The data were collected from July 2010 to June 2012.

(b) Measures of Index of Poverty Change

The most practiced poverty measures, e.g., poverty head count ratio, direct calorie intake, household expenditure etc. have limitations when calculating the poverty change due to scarcity of data. Measurement of the poverty change using data at two time points, e.g., before and after, is seriously affected by recall bias. Again, clients' perception on the change of their poverty situation may not be true all the time. Such perception is seriously affected by social development around them. Furthermore, feeling of being poor varies from culture to culture and influenced by respondents' characteristics. This paper proposed a technique to estimate the change in poverty situation based on the change in education and wealth status of the household.

(i) Education index

Formal education was measured as the individual respondent's children received formal education up to a certain standard. A score of one was given for each completed year of schooling. The educational scores before and after loans were collected. At first, the difference between the educational status of each child before and after the involvement in micro-credit by a client was calculated. Then changes of educational status of all children in a family were summed up. Finally, this educational score was divided by total number of children in a family for having the educational index.

(ii) Wealth index

Monthly income of the respondent's household was estimated from the earnings of all active members of the family and received from various income generating activities. At first monthly income of the respondent before the involvement in

micro-credit was subtracted from the monthly income after the involvement in micro-credit. Then the change of income of each respondent was found and recoded. The change of each asset item before and after the involvement in micro-credit was recorded. Then changes in asset item were multiplied by their appropriate weight and summed up to get the total asset change. Wealth index was found by adding the income change and total asset change.

Index of poverty change (estimated change in poverty situation) is the sum of Education Index and Wealth Index. For the convenience the estimated change in poverty situation may sometimes be termed as poverty index (PI). Poverty index was coded into five categories. These were 'fallen', 'no change', 'marginal', 'adequate' and 'safe' category. The respondents who got PI < 0 are referred to as 'fallen'. PI = 0 is defined as 'no change' which means this group of respondents could not change their poverty situation. The respondents who got $0<PI\leq 5$ are referred to as having marginal change. This group of respondents marginally overcame the poverty situation but due to any natural calamities or other accident there is a chance that their present poverty situation will fall below the poverty line. For $5<PI\leq 10$ the respondents have adequately overcame the poverty situation and there is a less chance to decline from their present poverty situation. The respondents who got the score of poverty index above 10 (PI > 10) are referred to as safe change, which means that they have changed their poverty situation permanently. In multinomial logistic regression, 'fallen' and 'no change' categories were merged into one category of 'no change'.

(c) Regression Analyses

Two-level random intercept binary logistic regression

For a dichotomous dependent variable the error distribution in regression model is likely to be binomial, hence binary logistic regression models are useful. A two-level random intercept binary logistic regression model, an extension of single level binary logistic regression model, was fitted using MLwiN 2.0 software to test the significance of micro-credit programmes of NGOs on poverty alleviation alongside other socio-economic factors. Let the binary response Y_{ij} which equals 1 if the micro-credit client (individual) i in village (community) j has experienced positive change in poverty situation and 0 otherwise. Then the probability that the micro-credit client has experienced positive change is $P_{ij} = Pr(Y_{ij}=1)$. If k independent variables $X_{ij1}, X_{ij2},...,X_{ijk}$ are measured at the individual level, then a two level random intercept binary logistic regression model can be written as follows:

$$\text{logit}(P_{ij}) = \beta_{0j} + \sum_{l=1}^{K} \beta_l X_{ijl} \qquad \text{with } \beta_{0j} = \beta_0 + u_{0j}$$

Where β_0 is a fixed component and u_{0j} is a community-specific component, the random effect which is assumed to follow a normal distribution with mean zero and variance σ^2_{u0}.

Multinomial logistic regression

When the response variable has more than two categories then the multinomial logistic regression is used. Let the response variable has J mutually exclusive and exhaustive categories, denoted by j=1, 2,…, J. The j^{th} category is taken as the reference category for the response variable. Because the ordering of the category is arbitrary, any category can be j^{th} category, so that the choice of the reference category is also arbitrary. Let there are k predictor variables, denoted by x_1, $x_2, \ldots x_k$. The multinomial logistic regression model is then specified in log odds form as:

$$Log\frac{P_j}{P_J} = \sum b_{jk}x_k \qquad \text{j=1, 2,..., J-1}$$

$$\text{and} \quad \text{k=0, 1,..., K}$$

$$\sum P_j = 1 \qquad \text{j=1, 2,..., J}$$

The multinomial logistic regression was fitted using SPSS 16 software. As the odds ratios of multinomial logistic regression are improper odds ratios the interpretation of results will be made in terms of probability.

III. RESULTS AND DISCUSSION

(a) Difference between estimated and perceived change in poverty situation

The total numbers of respondents were 406. According to the respondent's own perception, 76.1 percent of the respondents could change their poverty situation. However, on the basis of poverty change index (PI) about 50.5 percent of the respondents permanently overcame the poverty situation. The estimated percentages of respondents who experienced adequate change, marginal change, no change and deterioration in their poverty situation were 18.5, 18.0, 9.9 and 3.1 respectively (not shown in table). The concordance between estimated change and perceived change in poverty is examined by Chi-square test. The result suggests that both the measures of poverty change are significantly associated. Among the respondents who were found to achieve safe change in poverty situation about 87.8 percent reported that they overcame poverty with the help of micro-credit; the rest think that they did not have any change in their poverty situation (Figure 1).

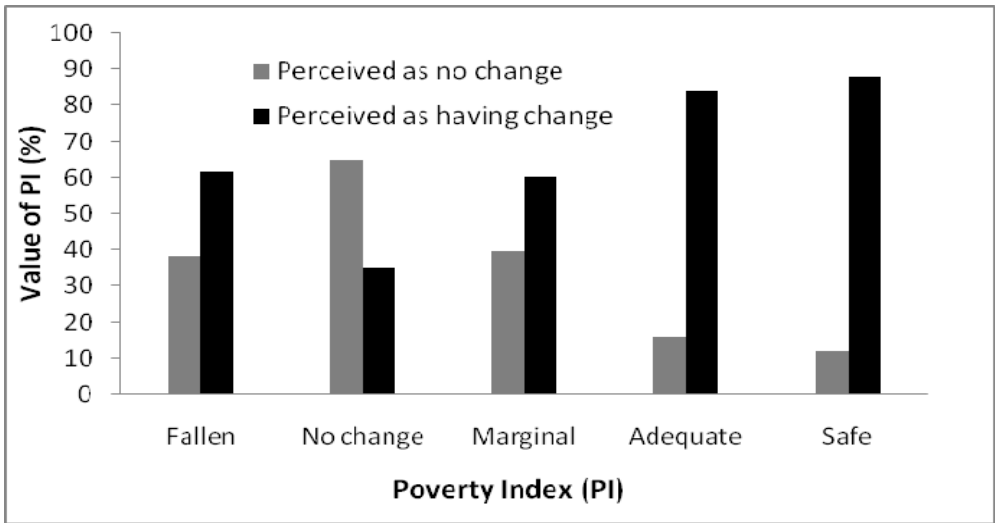

Figure 1. Estimated change in poverty situation by perceived change in poverty situation

Surprisingly 61.5 percent of the respondents who were found to experience further degradation in poverty situation by poverty change index (PI) reported to have positive change in poverty situation. This percentage was 35 percent among the respondents who did not achieve any change in poverty situation according to the estimate. These indicate that perceived change in poverty situation sometimes may be wrong. It is mentioned earlier that the feeling of being poor varies from culture to culture and influenced by respondents' characteristics. Sometimes individual clients having positive change in household education and wealth may not recognise the change as these changes are gradual. Furthermore, feeling of being poor sometimes come from the comparison with comparatively well-off households. The opposite is also true where client still being poor thinks that they overcome their poverty. The overall development in their surrounding (road communication, local infrastructure, possession of a single household/personal asset like TV/cell phone etc.) makes them think that they overcame their poverty by themselves.

(b) Determinants of Poverty Change

(i) Determinants of perceived poverty change

The results of two-level random intercept binary logistic regression model showed that though micro-credit programmes bring about change on poverty situation, different organisations had no significantly different effects on poverty alleviation (Table 1). This means that the respondents of all micro-credit organisations have similar experience of poverty alleviation. This result is similar to other studies

which suggest that microfinance interventions reduce poverty among the poor though the percentage is small (Khandker, 2001). If a respondent gets sufficient amount of loan, proper supervision, and uses loan in productive purpose in any organisation then she will be able to overcome the poverty situation. However, in single level model, it revealed that the respondents of SSS were 18.84 times significantly more likely to experience positive change in poverty situation than the respondents involved in GB (Table 1).

The results showed that the respondents having loan within Tk. 11000-15000 were 7.389 times more likely to experience poverty situation than the respondents who took loan within Tk. 1000-5000. This amount of (Tk. 11000-15000) loan is sufficient for any small business. On the other hand, the size of loan as Tk. 1000-5000 is too small for any kind of sustainable business and small credit only helps to improve consumption of the family and can contribute little to change their poverty level (Haque and Yamao, 2009; Hossain, 1988). The result is similar to that was observed in single level model.

The respondents who were not satisfied with the organisation's activities were 0.128 times less likely to eradicate poverty than the respondents who were satisfied. If a respondent is not satisfied with organisation's activities she will not be interested to take loan in future. Therefore, respondent's satisfaction level is an important indicator in alleviating poverty. Similar was observed in single level model. A study by Awunyo-Vitor et al. (2012) reveals that client's satisfaction of interest rate positively influence women's likelihood of participating in micro-credit programmes.

Like the single level model the main mean of asset change was a strong indicator of change in poverty situation in two-level model (Table 1). Poverty situation was 0.235 times less likely to be changed when the main mean of asset change was the combination of micro-credit, and agriculture and/or business compared to only micro-credit. This may be due to that when respondents are involved with micro-credit together with other business, they fail to concentrate on both and achieve less compared to when they concentrate solely on micro-credit based business. Even the situation is relatively worst when the poor respondents are doing something else other than trying the both.

In this analysis significant community effects were found which indicates that the respondents from different communities with same set of characteristics will exhibit different influences on the change in poverty situation. The community effect was greater than the effects of some important independent variables in the model. The standard deviation of the random effect for poverty change is $\sqrt{1.845} =$ 1.36. This means, for example, that a one standard deviation change in the community random effect has more or less similar effect on change in poverty

Table 1: Binary logistic regression model for poverty change with single level and two-level

Independent variables	Change in Poverty Situation					
	Single level model			Two-level model		
	β	S.E.	Odds ratio	β	S.E.	Odds ratio
Intercept	3.779***	0.878	43.793	4.307***	1.065	74.218
Name of NGOs (*r*: GB)						
ASA	-1.453**	0.607	0.234	-1.234	0.798	0.291
BRAC	-0.200	0.613	0.891	0.180	0.829	1.197
SSS	2.936***	0.748	18.844	1.272	1.311	3.568
PROSHIKA	1.657**	0.732	5.244	1.393	1.022	4.027
TMSS	2.479**	0.967	11.924	2.007	1.377	7.441
Amount of loan (Tk.) (*r*: 1000-5000)						
6000-10000	0 .366	0.586	1.442	0.429	0.678	1.536
11000-15000	2.264***	0.845	9.619	2.00**	0.957	7.389
Above 15000	0.544	0.676	1.722	0.285	0.745	1.329
Level of satisfaction (*r*: Satisfied)						
Not satisfied	-1.840***	0.688	0.159	-2.058***	0.732	0.128
Others	-2.559**	1.029	0.077	-2.910**	1.334	0.054
Main means of asset change (*r*: Only micro-credit)						
Micro-credit with others (agriculture, business etc.)	-1.365*	0.713	0.255	-1.450*	0.755	0.235
Other than micro-credit (agriculture, business etc.)	-5.530***	0.727	0.004	-5.911***	0.782	0.003
Random effect variance				1.845**	0.894	

Note: r denotes reference category; * p < 0.10, **p < 0.05 and ***p < 0.01 are the levels of significance. **β** denotes regression coefficient and S.E. denotes standard error of the regression coefficient.

situation when the mean of asset change was micro-credit with others (agriculture, business) compared to only micro-credit; have greater influences on poverty alleviation by being members of ASA, BRAC and SSS compared to that of GB. Results of the two-level random intercept binary logistic regression further suggest that if the random effect is considered then the model gives better insight. Also it helps to explain some unexpected results that were observed in single level model, e.g. organisation effect. Clearly it suggests that the micro-credit models of different organisations may have varying influence on the poverty alleviation, it is the variation in the communities which bring the difference in the outcomes.

(ii) Determinants of Estimated Poverty Change

Multinomial logistic regression model was used to identify the important predictors that have effects on estimated change in poverty situation (Table 2). Two-level multinomial logistic regression was not possible in this analysis because

of non-convergence of the results during analysis. We assume that there is no community effect in case of estimated poverty change. Results of multinomial model are presented in Table 2 and discussed in terms of the estimated probabilities corresponding to the estimated coefficient in Table 3. The estimated probabilities are calculated based on the reference respondent's characteristics. The reference respondent for multinomial logistic regression model is a member of GB, took loan before, the amount of loan she took was within Tk. 1000-5000 and the main mean of her asset change was only micro-credit. The estimated probabilities reveal that reference respondent has an estimated 31.2 percent probability of not to overcome the present poverty situation, 21 percent probability to have marginal change, 26.1 percent probability to have adequate change, and 21.6 percent probability to have safe change in the poverty situation.

Different organisations have significant effects on poverty alleviation in the analysis. The probability of respondents who does not have any change in their poverty situation increases by 15 percent points if the respondents belong to ASA. The probability of respondents having no change in poverty situation increases by 14.8 percent if the respondent came from TMSS. An increased probability up to 1.8 percent points is evident for the no change in poverty situation if the respondents involved in PROSHIKA. A significant decrease in the probability of respondents having no change in poverty situation is found if the respondent belongs to BRAC (26.8 percent) and SSS (22.9 percent). The probability of respondents who marginally overcame the poverty situation increases if the respondents involved in ASA, BRAC and PROSHIKA (by 2.9, 8.4, and 9.8 percent). The probability of achieving adequate change in poverty situation is much less compared to that of a member of GB except BRAC. A remarkable 39 percent point increase in the probability of safe change in poverty situation is observed if the respondents were involved in SSS.

The current analysis suggests that amount of loan has a significant impact on poverty alleviation. The probability of respondents having no change and marginal change in poverty situation decreases, whereas the probability of adequate and safe change in poverty situation increases if the respondent receives loan more than Tk. 1000-5000. If the respondent receives loan above Tk. 15000, her probability of safe change increases by about 17.1 percent points. The probability for safe change increases if the amount of loan increases. In general, micro-credit organisations offer a very small amount of loan ranging from Tk. 2000 to Tk. 5000 to the new members. This is not sufficient to invest in an income generating activity that can produce such earning by which one can pay weekly instalment after mitigating all necessary family requirements (Haque and Yamao, 2009).

Table 2: Multinomial logistic regression model for estimated poverty change

Independent Variables	Marginal			Adequate			Safe		
	β	S.E.	Odds Ratio	β	S.E.	Odds Ratio	β	S.E.	Odds Ratio
Intercept	-0.395	0.651		-0.179	0.652		-0.370	0.627	
Name of NGOs (*r*: GB)									
ASA	-0.264	0.591	0.768	-1.629**	0.637	0.196	-0.358	0.544	0.699
BRAC	0.486	0.623	1.625	0.164	0.602	1.179	-0.064	0.593	0.938
SSS	-0.565	0.887	0.568	-0.914	0.878	0.401	1.342*	0.706	3.825
PROSHIKA	0.326	0.699	1.385	-0.273	0.679	0.761	-0.404	0.647	0.668
TMSS	-0.742	0.876	0.476	-0.961	0.822	0.383	-0.260	0.740	0.771
Amount of loan (Tk.) (*r*: 1000-5000)									
6000-10000	0.043	0.480	1.044	0.959*	0.550	2.610	0.666	0.504	1.946
11000-15000	-0.656	0.712	0.519	0.303	0.748	1.354	0.097	0.675	1.102
Above 15000	-1.342*	0.723	0.261	0.189	0.718	1.208	0.691	0.648	1.996
Main means of asset change (*r*: only micro-credit)									
Micro-credit with others (agriculture, business etc.)	1.463**	0.606	4.318	0.825	0.576	2.281	0.396	0.535	1.486
Other than micro-credit (agriculture, business etc.)	0.079	0.507	1.082	-0.838*	0.495	0.433	-1.312**	0.434	0.269
Taken loan before (*r*: No)									
Yes	1.022**	0.467	2.779	1.053**	0.479	2.867	2.470**	0.457	11.820

Note: *r* denotes reference category; * $p < 0.10$, ** $p < 0.05$ and *** $p < 0.01$ are the levels of significance. **β** denotes regression coefficient and S.E. denotes standard error of the regression coefficient.

Table 3: Degree of change in poverty situation; adjusted predicted probabilities (percentage) from multinomial logistic regression model

	No change (r)	Marginal	Adequate	Safe
Name of NGOs				
ASA	46.2	23.9	7.60	22.3
BRAC	26.8	29.4	26.4	17.4
SSS	22.9	8.80	7.70	60.6
PROSHIKA	33.0	30.8	21.0	15.2
TMSS	46.0	14.8	14.7	24.5
GB (r)	**31.2**	**21.0**	**26.1**	**21.6**
Amount of loan				
1000-5000 (r)	**31.2**	**21.0**	**26.1**	**21.6**
6000-10000	19.1	13.4	41.7	25.7
11000-15000	30.8	10.8	34.9	23.5
15000+	28.1	4.90	28.3	38.7
Main mean of asset change				
Micro-credit with Others (agriculture, business etc.)	14.8	41.9	28.2	15.2
Others (agriculture, business etc.)	43.9	32.0	15.9	8.20
Only micro-credit (r)	**31.2**	**21.0**	**26.1**	**21.6**
Took before loan				
Yes	7.40	13.9	17.8	60.8
No (r)	**31.2**	**21.0**	**26.1**	**21.6**

Note: r refers to reference category

Significant effects of main means of asset change have been evident in the analysis. The probability of respondents who does not experience change in their poverty situation increases by 12.7 percent points if the main means of asset change was others mean rather than micro-credit. The probability of marginal change in poverty situation have been increased by 20.9 percent points when main means of asset change was the combination of micro-credit and others. This is because the respondents who marginally overcame the poverty situation, needed more amount of money in addition to that received as micro-credit. The probability decreases for the safe change in poverty situation by 13.4 percent points if the respondents use other means for their asset change. The probability of adequate change in poverty situation decreases by 10.2 percent points when main means of asset change was other means rather than micro-credit. The results suggest that micro-credit has some effect in reducing poverty. Such result supports the findings

by Khandker (1998) that micro-credit activities are economically efficient and generate a net surplus for the poor borrowers.

If the respondent took loan before his probability of achieving safe change in poverty situation increases by 39.2 percent points. Respondents who took loan before went through the experiences that equip them to better manage the loan and to avoid losses that may be encountered. A study by Chowdhury *et al*. (2005) suggests that the impact of micro-credit on poverty is particularly strong for about six years with some leveling off after that point.

IV.CONCLUSION

The present study explored the likely impact of micro-credit programmes of six organisations on poverty alleviation in Bangladesh. Firstly, this study used the approach of measuring poverty change based on respondents' perception. Finally, this study devised an alternative measure of poverty change based on change in household wealth and education of a household. This study reveals that the perceived change in poverty was 76.1 percent. However, the analysis of poverty change index (PI) suggests that about 50.5 percent of the respondents permanently overcame the poverty situation. The main contributing factors for change in poverty situation revealed from the analyses were amount of loan, different organisations, satisfaction level, taken loan before and main means of asset change (mainly micro-credit). The specific recommendations made from the results are i) the lowest amount of loan should be increased to Tk 11000- 15000 for sustainable business and ii) the satisfaction of the clients should be increased with proper field visit and other feasible means (these might be lowering interest rate, delaying the starting time of first instalment etc.). Analysis suggested that there are some villages where clients are performing differently than clients of other villages. This means there are some community characteristics which vary between the villages. These may be literacy rate, communication network, percent awareness of the availability micro-credit, level and severity of poverty, differences in main profession of the household head, the overall attitude and behaviour of the clients and the motivation, and sincerity of the officials of the organisations in the communities. Further study should be conducted to identify and prioritise the community characteristics to accelerate the poverty alleviation process in the villages where the performance of micro-credit is still poor. Though micro-credit programmes in Bangladesh have positive impact in alleviating poverty but it has varying effects for different organisations. The strategy suggested by Islam et al. (2012) based on different assessment indicators namely, client's knowledge of actual interest rate, visit by field workers, if request is needed to take loan, client's perception on the affordability of loan, client's satisfaction, impact of micro-credit on poverty change and operating cost of the organisation for the programme may be used to find out the best practice.

REFERENCES

Adjei, J.K., Arun, T., Hossain, F. (2009). *The Role of Microfinance in Asset Building and Poverty Reduction: The Case of Sinapi Aba Trust of Ghana*. Manchester: Brooks World Poverty Institute.

Akter, S. (1996). Participation of Rural Women in Credit Programmes for Poverty Alleviation in Bangladesh, Paper Presented in Regional Seminar on, 'Recent Changes on the Rural Economy In Bangladesh,' Jointly organized by the Bangladesh Economic Association and Faculty of Agricultural Economics and Rural Sociology, Bangladesh Agricultural University, Mymensingh. Held on 27 November 1997.

Alam, A. B. K. N. (2005). Rural Women in Micro-Credit Programmes of Poverty Alleviation: A Study of BRAC in Sadar Upazila of Netrokona District. Unpublished M.S. Thesis, Department of Agricultural Finance. Bangladesh Agricultural University, Mymensingh.

Awunyo-Vitor, D., Abankwah, V, and Kwansah, J.K.K (2012). "Women Participation In Microcredit and its Impact on Income: A Study of Small-Scale Businesses in the Central Region Of Ghana", *American Journal of Experimental Agriculture,* 2(3): 502-515.

BBS (2005). Report of the Household Income and Expenditure Survey (HIES) 2005. Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.

BBS (2011). *Report of the Household Income and Expenditure Survey (HIES) 2010*. Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.

Bruntrup, Michael, Huda, A., Alauddin, S. M. and Rahman, M. (1997). Impact Assessment of ASA. Dhaka: Association for Social Advancement (ASA).

Buckland, J. (1996). "The Distributional Impact of Income-Generation Programs in Bangladesh", *Journal of Development Studies*, 3(17): 385-404.

Chowdhury, M. J. A., Ghosh, D. and Wring, R. E. (2005). "The Impact of Micro-Credit on Poverty: Evidence from Bangladesh", *Progress in Development Studies*, 5(4): 298-309.

CIA World Fact Book (2011). (https://www.cia.gov/library/publications/the-world-factbook/geos/bg.html). Retrieved September 13, 2011.

Coleman, B. E. (2001). *Measuring Impact of Microfinance Programs*. Finance for the Poor, Asian Development Bank, December 2001, 2(4): 5-7.

Copestake, James, Bhalotra, Sonia, Johnson and Susan (2001). "Assessing the Impact of Micro-Credit: A Zambian Case Study", *The Journal of Development Studies*, 37 (4): 81-100.

Dugger, C. W. (2004). *Debate Stirs Over Tiny Loans for World's Poorest*. New York Times.

Edgecomb, E. and Barton, L. (1998): *Social Intermediation and Microfinance Programs: A Literature Review*. Bethesda, MD: Development Alternatives Inc.

Ghosh, A. R. (1997): Impact of Homestead Farming on Income and Women's Development in PROSHIKA Programme Area in Gabtali Upazilla of Bogra district. Unpublished M.S Thesis, Department of Agricultural Economics, Bangladesh Agricultural University, Mymensingh.

Haque, M. S. and Yamao, M. (2009). "Can Micro-Credit Alleviate Rural Poverty? A Case Study of Bangladesh", *International Journal of Human and Social Sciences*, 4 (13): 929-937.

Hashemi, S. M., Schuler, S. R. and Riley, A. P. (1996). "Rural Credit Programmes And Women's Empowerment in Bangladesh", *World-Development-Oxford*, 24(4): 635-653.

Hossain, M. (1984). *Credit for The Poor*. Research Monograph No. 4. Bangladesh Institute of Development Studies, Dhaka.

Hossain, M. (1988). *Credit for Alleviation of Rural Poverty: The Grameen Bank in Bangladesh*. IFRI Research Report 65. International Food Policy Research Institute, Washington, D.C.

Humal, D. and Mosley, P. (1996). *Finance Against Poverty*, Volumes 1 and 2, Routledge: London.1996.

Imai, K. S. and Azam, M. S. (2010). Does Microfinance Reduce Poverty in Bangladesh? New Evidence from Household Panel Data. Research Institute for Economics and Business Administration, Kobe University,1-2 Rokkodai, Nada, Kobe 657-8501 Japan.

Islam, M. R. (2009). Comparative Performance of NGO Services in A Selected Area of Mymemsingh District. Unpublished M.S. thesis, Department of Agricultural Economics (Finance). Bangladesh Agricultural University, Mymensingh.

Islam, S. (1999). Micro-Credit for the Poor: A Study of Small Farmers Development Project (SFDP) in Sadar Thana of Bogra District. Unpublished M.S. thesis, Department of Agricultural Economics (Finance). Bangladesh Agricultural University, Mymensingh.

Islam, M.A., Khatun, M.A., Hossain, D. and Alom, J. (2012). "Micro-Credit Programmes of Different NGOs/MFIs: A Comparative Study", *Journal of the Bangladesh Agricultural University*, 10(2): 297-302.

Jalil, M. A. (2005). Impact of Micro-Credit Program of RDRS on Rural Women in Some Selected Areas of Kurigram District. Unpublished M.S. Thesis, Department of Agricultural Economics (Finance). Bangladesh Agricultural University, Mymensingh.

Jehangir, W. A., Ashfaq, M., Ali, A. and Sarwar, N. (2002). "Use of Credit for Poverty Reduction by Small Farmers. International Water Management Institute, Lahore, Pakistan", *Pakistan Journal of Applied Sciences*, 2(7): 777-780.

Khandker, S. R. and Chowdhury (1996). *Targeted Credit Programs and Rural Poverty in Bangladesh*. World Bank Discussion Paper 306, Washington, D.C.

Khandker, S. (1998). *Fighting Poverty with Micro-credit: Experience in Bangladesh*. New York: Oxford University Press for the World Bank.

Khandker, S. (2001). Does Micro-Finance Really Benefit the Poor? Evidence from Bangladesh. Asia and Pacific Forum on Poverty: Reforming Polices and Institutions for Poverty Reduction, to be Held on Asian Development Bank, Manila.

Khandker, S. (2003). *Micro-Finance and Poverty: Evidence Using Panel Data from Bangladesh*. World Bank Policy Research Paper 2945, World Bank, Washington.

Madhura, S. (2007). "The Microcredit Alternative?", *Economic and Political Weekly*, 42 (13): 1171-1175.

Microcredit Regulatory Authority (2013). Microcredit in Bangladesh. www.mra.gov.bd.

Miller, J. and Martinez, R. (2006). "Championship league: An Overview of 80 Leading Latin American Providers of Microfinance", *Microbanking Bulletin*, April 2006.

Ministry of Finance (MoF) (2009). Bangladesh Economic Review. Dhaka: Economic Advisors Wing, Finance Division. Ministry of Finance, Government of the People's of Bangladesh.

Morduch, J. (1998). *Does Microfinance Really Help the Poor? New Evidence from Flagship Programs in Bangladesh*. MacArthur Network, Princeton University.

Morduch, J. (1999). "The Microfinance Promise", *Journal of Economic Literature*, 37(4): 1569-1614.

Mustafa, Shams, Ara, I., Banu, D., Hossain, A., Kabir, A., Mohsin, M., Yusuf, A. and Jahan, S. (1996). Beacon of Hope: An Impact Assessment Study of BRAC's Rural Development Programme. Research Division, Bangladesh Rural Advancement Committee (BRAC), Dhaka.

Pallavi, C. and Ramakumar, R. (2002). "Micro-Credit and Rural Poverty: An Analysis of Empirical Evidence", *Economic and Political Weekly*, 37(10): 955-965.

Parveen, S. and Chaudhury, M. S. R. (2009). "Micro-Credit Intervention and Effects on Empowerment Of Rural Women: The BRAC experience", *Bangladesh Research Publications Journal*, 2(3): 641-647.

Pitt, M. and Khandker S. R. (1996). Household and Intra-Household Impact of the Grameen Bank and Similar Targeted Credit Programs in Bangladesh. World Bank Discussion Paper No. 320; Washington, D.C.

Pitt, M. M., Khankder S. R., Chowdhury, O. H., Millimet, D. L. (2003). "Credit Programs for the Poor and the Health Status of Children in Rural Bangladesh", *International Economic Review*, 44(1): 87-118.

Proshika (1995). Impact Assessment Survey Report; Proshika: A Centre for Human Development; Dhaka.

Schrieder, G. and Sharma, M. (1999). "Impact of Finance on Poverty Reduction and Social Capital Formation: A Review and Synthesis of Empirical Evidence", *Savings and Development*, 23(1): 67-93.

Sebstad, J. and Chen, G. (1996). Overview of Studies of the Impact of Microenterprise Credit. Washington: Management Systems International.

Sen, B. (2003). "Drivers of Escape and Descent: Changing Household Fortunes in Rural Bangladesh", *World Development*, 31(3): 513-534.

Stephens, B. and Tazi, H. (2006). "Performance and Transparency: A Survey of Microfinance in South Asia", *Microbanking Bulletin*, April 2006.

Uddin, M. H. (2000). A Study on the Impact of Grameen Bank Credit Programme on Rural Women Beneficiaries in A Selected Area of Mymensingh District. Unpublished M.S. Thesis, Department of Agricultural Finance. Bangladesh Agricultural University, Mymensingh.

Westover, J. (2008). "The Record of Microfinance: The Effectiveness/Ineffectiveness of Microfinance Programs as A Means of Alleviating Poverty", *Electronic Journal of Sociology*, ISSN: 1198 3655.