

Measurement of the impact of micro-credit programs on poverty alleviation in Bangladesh

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Abstract

The main purpose of this study is to measure the impact of micro-credit programs on selected non-government organizations (NGOs) regarding poverty alleviation in Bangladesh using a purposive sample of 1000 credit borrowers. Alongside respondents' perceived change in a poverty situation, this study developed an alternative measure of poverty change based on changes in household wealth and educational attainment. This study found that the perceived change in poverty was 78.1 percent. However, the poverty change index (PI) examination indicates that around 55.6% of the respondents had successfully overcome their poverty. According to the analysis of multinomial logistic regression and two-level binary logistic regression, the amount of loan, various NGOs' performance, satisfaction level, previous loan, and micro-credit as the main instruments of asset and poverty change. Significance variation at the community level was found in this study, which means that respondents from various communities with similar attributes will demonstrate distinct impact on the evolution of the poverty situation. More research should be conducted to identify the causes of this difference to maximize the impact of microcredit.

Keywords Micro-credit, Leading NGOs, Poverty Alleviation, Efficiency, Satisfaction level.

Paper type Research paper

1. Introduction

Microcredit is recognized as a successful tactic for eradicating poverty in rural areas where traditional credit is unavailable (Miller & Martinez, 2006). There is mounting evidence that microcredit is a successful strategy for generating employment, expanding enterprises, and enhancing a beneficiary's productive potential (Al Mamun, Abdul Wahab, & Malarvizhi, 2010; Pathak & Gyawali, 2010; Sahu, Agarwala, & Maity, 2021). It mostly has an impact on reducing poverty. Savings, micro insurance, and training play a role in Bangladesh's efforts to reduce poverty (Badiuzzaman, Uddin, & Hossain, 2020). Microfinance is the best method for eradicating poverty in most developing nations (García-Pérez, Fernández-Izquierdo, & Muñoz-Torres, 2020). Numerous studies have been



conducted to determine the viability of microcredit programs. Still, some of these studies have shown that microfinance initiatives in the world's poorest regions had positive outcomes, effects on poverty reduction, the standard of living, social well-being, empowerment, and entrepreneurship in the urban poor (Hasan, Singh, Agarwal, & Kushwaha, 2022; Atiase, Wang, & Mahmood, 2019. ; Ncanywa & Getye, 2016; Singh, Batra, Sharma, & Singh, 2021; Banu, Hossain, Haque, & Ahmad, 2021; Chomen, 2021; Gutu & Mulugeta, 2016; Madhura, 2007; Parveen, & Chaudhury, 2009). In rural area of Bangladesh, a large number of NGO's and Microfinance Institutes (MFIs) provide Microcredit programs. This program offered by NGO's and MFIs differ in terms of their structure, terms and conditions and interest rates.

In terms of methodological approach, the empirical studies on the effect of microcredit on poverty are quite inconsistent, which is reflected in many studies conducted by Copestake, Bhalotra, Johnson, and Susan (2001); Westover (2008); Imai and Azam (2012). Some studies, like Bruntrup, Huda, Alauddin, and Rahman, (1997) have only used descriptive statistics for analysis. They have not yet used a multivariate technique to determine the level of poverty to which micro-credit clients belong and to measure the impact of micro-credit programs on poverty alleviation in Bangladesh. In these circumstances, to fulfill this research gap, it is essential to use multivariate technique for determining the poverty level and for measuring the impact of microcredit programs in alleviating Bangladesh's poverty. The present study aims to measure the impact of microcredit programs of selected non-government organizations (NGOs), namely Association for Social Advancement (ASA), Bangladesh Rural Advancement Committee (BRAC), Grameen Bank (GB), BURO and Thengamara Mohila Sabuj Sangha (TMSS) on poverty alleviation in Bangladesh.

2. Objectives of the study

The main purpose of this study is to measure the impact of micro-credit programs of selected non-government organizations (NGOs) on poverty alleviation in Bangladesh. The additional objectives are as follows:

- i) To determine the levels of poverty to which micro-credit clients belong;
- ii) To determine whether micro-credit programs have any real impact on alleviating poverty and;
- iii) To evaluate the comparative performances of NGOs providing micro-credit in alleviating poverty.

3. Data and methods

3.1 Data collection

To participate in the study, individuals were chosen from the Bangladesh Rural Advancement Committee (BRAC), Grameen Bank, Association for Social Advancement (ASA), BURO, and Thengamara Mohila Sabuj Sangha (TMSS). Various places, including Chittagong, Comilla, Cox's Bazar, Feni, and Jhenaidah, were used for the fieldwork. The districts were chosen based on numerous agro-climate and economic factors. The respondents were chosen using the multi-stage simple random sampling technique. As previously noted, the first point chooses five Upazilas from the district total. Five unions are picked from each Upazila at the second level using a random sample procedure. The next stage involves choosing five communities within each union. Finally, lists of respondents of the selected villages are collected from the NGO's office of the respective Upazilas.

The sample size of the respondents was estimated by the use of the formula (Guilford & Fruchter, 1978):

$$N = \frac{Z^2 pq}{d^2}$$

Where N = minimum sample size, Z = 1.96, which corresponds to the 95 percent confidence level, p = 2 percent prevalence (0.02), q = 1-P = 0.98, d = 2 percent precision level (0.02) and

$$N = \frac{1.96^2 \times 0.02 \times 0.98}{0.02^2} = 188$$

When adjusted for a 10 percent non-responder's score, N is 210. Therefore, a survey of 210 respondents was chosen separately from the selected NGO's. Therefore 210 questionnaires were prepared. After completing the schedule and questionnaire, each selected respondent was interviewed separately. This researcher has collected 210×05=1050 questionnaires from the selected NGOs of different districts. Finally, the total sample size was 1000. The data were collected from July 2021 to June 2022.

3.2 Measures of index of poverty change

The cost of basic need (CBN) method, direct calorie intake method, FGT approach, multidimensional poverty index, etc., have limitations for estimating changes in poverty. Considering the respondent's changing wealth position and level of education, this paper proposed a technique for estimating the poverty situation.

The level of formal education was determined by how much formal education each respondent's children received. Each year of schooling that was completed resulted in a score of one. Before and after loans were obtained, the academic results were gathered. The difference in each child's academic standing before and after a client participated in microcredit was first calculated. Then, changes in each child's educational level within a household were tallied. The educational index was then calculated dividing this score by the total number of children in a family.

The household respondent's monthly income was calculated based on the incomes of all active family members from various sources of income. First, the respondent's pre-microcredit monthly income was deducted from their post-microcredit monthly income. The change in each respondent's income was then identified and recorded. The overall asset change was then calculated by multiplying each asset item's changes by their corresponding weight. The asset index was created by combining the income change and the total asset change.

The poverty change (estimated change) index is the sum of the education and asset index. The estimated change in poverty situation is commonly referred to as the "poverty index (PI)" for convenience. Let k predictor variables, denoted by x_1, x_2, \dots, x_k . The equation is then expressed as given (Liao, 1994).

$$\log \frac{P_j}{P_j} = \sum b_{jk} x_k \quad \text{where, } j=1, 2, \dots, J-1, \text{ and } k= 0, 1, \dots, K$$

$$\sum P_j = 1 \quad \text{where, } j=1, 2, \dots, J$$

The poverty index (PI) has been categorized into five types. These are the 'dropped,' 'unaltered,' 'marginal,' 'adequate,' and 'healthy shift' categories. Respondents who received $PI < 0$ are referred to be 'dropped.' Respondents who received $PI = 0$ are referred to as 'unaltered,' suggesting that this group of respondents could not change their poverty. Respondents who got $0 < PI \leq 5$ (P_1 greater than zero but less than five) are referred to as marginal change. This respondent group overcame the poverty situation marginally. However, due to unexpected natural disasters or other events, there is a possibility that their current poverty situation will fall below the poverty line. If $5 < PI \leq 10$ (P_1 is greater than five but less than ten), the respondents have sufficiently overcome the poverty situation, and there is less chance to decline from their present poverty situation. The respondents with a poverty index score above 10 ($PI > 10$) are referred to as a healthy shift, meaning

their poverty condition has improved permanently. The 'dropped' and 'unaltered' categories were combined into one 'unaltered' category in multinomial logistic regression.

4. Literature review

Several vital advantages and strengths brought about by the practice of microcredit programs in impoverished and underprivileged areas of the world have been noted in numerous studies. Numerous studies have found benefits in terms of living standards. For instance, Bhuiya (2016) discovered that the respondents' access to microloans helped them provide their kids with higher education. Gutu and Mulugeta, (2016) reported that once the beneficiaries joined the microfinance organizations, their profit, savings, and diet improved. Chomen, (2021) found that 87% of the beneficiaries are aware of credit and saving institutions' contribution to eradicating poverty. The study concluded that factors such as education level, gender, proximity to the lending institution, use of the loan for its intended purposes, and voluntary savings play a significant role in the model used to predict the increase in income of microcredit borrowers. The microfinance industries have improved the standard of living for the poor population who used microfinance as the poor's willingness and repayment behavior have flourished (Wright, Mutesasira, Okpara, Palmer, Walls, Burgess, & Hansen, 2019). Several studies look at the effects of microcredit (Tchakoute-Tchuigoua & Soumaré, 2019). They discovered that microcredit is rarely viable among the poor, even at low-interest rates and hardly ever reaches the poorest. Ngong, Thaddeus, and Onwumere, (2022) explained the long-term connection between poverty reduction and microcredit inclusion. Islam, (2021) reveals that the occupation dynamics of the respondents' families have changed structurally from agricultural to retail companies due to IMFS. The three elements of empowerment—economic empowerment (ECEM), socio-cultural empowerment (SCEM), and family empowerment—have all been strengthened by IMFS, which has also significantly influenced household income, savings, and expenditure. Hassan & Saleem (2017) have concluded that microcredit programs help women's economic and social empowerment. In industrialized nations, microfinance has the power to enhance self-employment and foster the growth of micro businesses (Nogueira, Duarte, & Gama, 2020). Adjei, Arun, and Hossain (2009) found a 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, Khankder, Chowdhury, and Millimet (2003) found that credit going to females has a large and significant impact on health measures for children. Atiase, Wang, and Mahmood (2019) have explained that microcredit positively affects SMEs in Ghana that creates jobs. According to a South African study, microcredit is an efficient tool for economic development and negatively correlates with unemployment (Ncanywa & Getye, 2016. Sahu, Agarwala, & Maity, 2021; Sahu, Datta, & Maity, 2021) demonstrate that micro-enterprises in rural India have a favorable relationship with employment creation. According to Singh, Batra, Sharma, and Singh (2021), microcredit utilization patterns are favorably related to economic activity. Banu, Hossain, Haque, and Ahmad (2021) reported the significant positive impact of microfinance on participants' average income.

Some other studies found that microcredit has no impact on the poverty rate. Due to the increased debt load, poor households became poorer. For instance, research has revealed that the moderately poor benefited from microfinance programs more than the extremely poor, and the effects of microcredit differed by income category (Copestake, Bhalotra, Johnson & Susan. 2001; Morduch, 1998; Dugger, 2004; Coleman, 2001) found that programs were reaching the poor less than they reached relatively wealthy people. Buckland (1996) found that the NGOs worked with a poor section of the population, although not from the poorest section. Due to the high-interest rates, microcredit can significantly worsen the financial status of the poorest people and lead to serious over-indebtedness among borrowers (Seng, 2018). The empirical analyses regarding the impact of micro-credit on poverty are very mixed in terms of methodological approaches, which are reflected in many studies. They have not yet used a unique multivariate technique to determine the level of poverty and to measure the impact of micro-credit programs on poverty alleviation in Bangladesh. In these circumstances, to fulfill this research gap, it is essential to use a multivariate technique to determine the levels of poverty to which micro-credit clients belong and to measure the impact of micro-credit programs on poverty alleviation in Bangladesh. Additionally, due to some community effects, customers from various communities with the same attributes may perceive the effects of microcredit differently. This issue needs to be addressed (using multilevel modeling).

5. Regression analysis

5.1 Model for two-level random intercept binary logistic regression

In the general case, the two-level random intercept binary logistic regression model is the expansion of the single-level binary logistic regression model (Goldstein, 2003). For a discrepant dependent variable, the error distribution in a regression model is likely to be binomial; hence binary logistic regression models are applicable. This model was fitted using MLwiN 2.0 software to test the significance of NGO micro-credit programs on poverty alleviation alongside other socio-economic factors. Let the binary response Y_{ij} , which equals one if the micro-credit client (individual) i in the village (community) j has experienced a positive change in poverty situation and 0 otherwise. Then the probability that the micro-credit client has experienced positive change is $P_{ij} = P_r (Y_{ij}=1)$. If k is denoted as independent variables and $X_{ij1}, X_{ij2}, \dots, X_{ijk}$ are evaluated at the individual level, then a two-level random intercept binary logistic regression model can be written as follows:

$$\text{Logit} (P_{ij}) = \beta_{0j} + \sum_{i=1}^k \beta_1 X_{ij1} \quad \text{with} \quad \beta_{0j} = \beta_0 + u_{0j}$$

Where β_0 is a constant element, u_{0j} is a community-specific component of the random effect which is assumed to follow a normal distribution with mean zero and variance $\alpha_{u_0}^2$.

5.2 Multinomial logistic regression

Multinomial logistic regression is used when dependent variables involve three or more categories. A multinomial logistic regression with a dependent variable that has a single category must have “J-1” logistic regression models (Liao, 1994; Long & Freese, 2006; Greene, 2003). Let the response variable has J mutually exclusive and exhaustive categories, denoted by $j=1, 2, \dots, J$. 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} the category, so the choice of the reference category is also arbitrary. Let k predictor variables, denoted by X_1, X_2, \dots, X_k . The model of multinomial logistic regression is then expressed as given (liao, 1994).

$$\text{Log} \frac{P_j}{P_J} = \sum b_{jk} x_k \quad \text{where, } j=1, 2, \dots, J-1, \text{ and } k= 0, 1, \dots, K$$

$$\sum P_j = 1 \quad \text{where, } j=1, 2, \dots, J$$

SPSS 20 was used to fit the multinomial logistic regression. The results will be interpreted in terms of probability because the odds ratios of multinomial logistic regression are improper.

6. Results and discussion

6.1 Comparing the estimated and perceived changes in the poverty situation One thousand people responded in total. 78.1 percent of respondents believed they could alleviate their poverty through their perceptions. However, based on the poverty change index (PI), around 55.6 percent of the respondents permanently overcame the poverty situation. The estimated percentages of respondents who experienced adequate change, marginal change, unaltered, and dropped in their poverty situation were 17.5, 16.0, 10.9, and 3.1, respectively (not shown in the table). The Chi-square test is used to determine whether the estimated and perceived changes in poverty are consistent. Among the respondents who were found to achieve safe change in their poverty situation, about 89.8% 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. Surprisingly, 67.5 percent of the respondents who were found to experience further degradation in poverty by the poverty change index (PI) reported a positive change in the poverty situation. According to estimates, this percentage was 40% among respondents whose poverty position remained unchanged. These indicate that perceived change in poverty situations sometimes may be wrong. It is mentioned earlier that the feeling of being poor varies from culture to culture and is influenced by respondents' characteristics. Sometimes, clients with a positive change in household education and wealth may need to recognize the change as these changes are gradual. Additionally, comparing one's household to others that are comparably well-off can sometimes cause one to feel destitute. The contrary is also true, where a client still in poverty believes they have overcome it. They believe they have overcome their poverty independently because of the general progress in their neighborhood.

6.2 Determinants of poverty change

(i) Factors affecting the perceived change in poverty

The results of a binary logistic regression model with a two-level random intercept revealed that, although microcredit programs changed poverty status, there were no appreciable differences between the effects of different

organizations on reducing poverty (Table 1). This indicates that all microcredit institutions' responders have similar experiences with reducing poverty. This result is consistent with other studies suggesting that microfinance interventions reduce poverty among the poor, although the percentage is small (Khandker, 1998). If a respondent receives sufficient credit and adequate supervision and mobilizes credit for productive purposes, she will be able to overcome poverty. However, the single-level model revealed that the respondents of TMSS were 10.92 times more likely to experience positive change in poverty than the respondents involved in BRAC (Table 1).

Table 1

Model for binary logistic regression for poverty change with single-level and two-level

| Independent Variables changes in the poverty situation | | | | | | |
|---|-------------------------|-------|------------|-------------------------|-------|------------|
| | Single level model | | | Two level model | | |
| | Coefficient (β) | S. E | Odds Ratio | Coefficient (β) | S. E | Odds Ratio |
| Intercept | 2.446*** | 0.778 | 33.234 | 3.207*** | 0.033 | 54.121 |
| List of NGOs (m: BRAC) | | | | | | |
| BURO | 2.234** | 1.324 | 1.214 | 2.224 | 1.728 | 1.234 |
| GB | -0.100 | 1.413 | 1.391 | 1.130 | 1.459 | 0.137 |
| ASA | 1.657** | 0.732 | 5.244 | 1.393 | 1.022 | 4.027 |
| TMSS | 3.479** | 0.457 | 10.924 | 1.330 | 1.226 | 4.441 |
| Amount of Loan Range (Tk.) (m: 5000-10000) | | | | | | |
| 11000-20000 | 0.333 | 0.576 | 1.327 | 0.125 | 0.687 | 1.459 |
| 21000-30000 | 3.264*** | 0.455 | 8.619 | 3.00** | 0.567 | 6.289 |
| 30000 and above | 0.544 | 0.628 | 1.365 | 0.125 | 0.643 | 1.431 |
| Satisfaction level (m: High) | | | | | | |
| Low | 2.340*** | 1.556 | 1.149 | -3.132*** | 1.342 | 1.121 |
| No satisfaction | 1.221** | 2.023 | 1.074 | -1.560** | 2.211 | 2.213 |
| Primary means of asset change m: Micro-credit only | | | | | | |
| Micro-credit with others (agriculture, business, etc.) | -1.365* | 0.713 | 0.244 | -1.450* | 0.755 | 0.224 |
| Other than micro- credit (agriculture, business, etc.) | -5.530*** | 0.727 | 0.005 | -5.911*** | 0.782 | 0.004 |
| Random effect variance | | | | 2.637** | 1.884 | |

Note: m indicates reference; significance levels are * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$, respectively; β denotes regression coefficient, and SE denotes standard error of the regression coefficient.

The results showed that the respondents had loans within Tk. 21000-30000 were 6.289 times more likely to experience poverty than respondents who took loans within Tk. 5000-10000. This amount of (Tk.

21000-30000) loan is enough for any small business. On the other hand, for any form of a sustainable business, the loan size of 5000-10000 taka is too small, and small credit only helps to increase the family's consumption and can contribute little to changing their poverty level (Haque & Yamao, 2009; Hossain, 1984). The result is similar to that was observed in single level model.

The respondents who were not satisfied with the organization's activities were 1.121 times less likely to eradicate poverty than the satisfied respondents. If a respondent is not satisfied with the activities of the organizations, she will not be involved in taking credit in the future. Therefore, the level of satisfaction of respondents is a significant predictor for alleviating poverty. A Similar was observed in the single-level model. According to a study by Awunyo-Vitor, Abankwah, and Kwansah (2012), client satisfaction with interest rates benefits women's propensity to participate in microcredit programs.

Like the single-level model, the main mean of asset change was a strong indicator of change in poverty in the two-level model (Table 1). Poverty situations were .224 times less likely to be improved when the main mean of asset change was the combination of micro-credit and agriculture and business compared to only micro-credit. This may be because when respondents are engaged with micro-credit and other businesses, they need help to focus on both and accomplish less than when they concentrate solely on businesses dependent on micro-credit.

Significant community effects were observed in this research, indicating that respondents from various communities with the same attributes will have varied influences on changes in the poverty condition. The community effect was more significant than the effects of some essential independent variables in the model. The standard deviation of the random effect for poverty change is $\sqrt{2.637}=1.623$. This means, for example, that a one standard deviation change in the random community effect had a more or less similar effect on change in poverty situation when the mean of asset change was micro-credit with others (agriculture, business) compared to only micro-credit; have more significant influences on poverty alleviation by being members of BURO, GB and ASA.

Results of the two-level random intercept binary logistic regression also imply that if the random effect is taken into account, the model provides more helpful information. It also helps explain a few unexpected outcomes seen in a single-level model, such as the organization effect. It is obvious that

this shows that different organizations' micro-credit schemes may have varying effects on alleviating poverty; the variation in the communities brings the difference in the outcomes.

ii) Factors affecting the estimated change in poverty

A multinomial logistic regression model was used to determine the significant factors impacting the estimated poverty situation change (Table 2). Due to the non-convergence of the results during the analysis, two-level multinomial logistic regression was not possible in this study. In the case of estimated changes in poverty, we assume that there would be no combined effect. Table 2 presents the results of the multinomial model, and Table 3 discusses them in terms of the estimated probabilities that correspond to the estimated coefficient. The approximate probabilities are determined based on the characteristics of the reference respondent. The reference respondent for the multinomial logistic regression model is a member of BRAC and took a loan before; the amount of the loan she took was within Tk. 5000-10000, and the main mean of her asset change was only micro-credit. The evaluated probabilities reveal that the reference respondent has an evaluated 41.2% probability of not overcoming the current situation of poverty, 31% probability of marginal change, 16.1% probability of adequate change, and 11.7% probability of a healthy shift in the situation of poverty.

Table 2
Multinomial logistic regression model

| Independent Variables | Marginal change | | | Adequate change | | | Healthy shift | | |
|---|---|-------|------------|------------------|-------|------------|------------------|-------|------------|
| | β (coeff.) | SE | Odds Ratio | β (coeff.) | SE | Odds Ratio | β (coeff.) | SE | Odds Ratio |
| Intercept | 1.886 | | 0.231 | 1.321 | | 0.411 | 1.211 | | 0.231 |
| | List of NGOs (m: BRAC) | | | | | | | | |
| BURO | 0.213 | 0.123 | 1.231 | 2.433** | 1.001 | 1.211 | 1.422 | 1.001 | 1.110 |
| GB | 0.330 | 0.880 | 2.001 | 1.201 | 0.099 | 2.330 | 1.002 | 0.889 | 1.072 |
| ASA | 0.998 | 0.699 | 1.385 | 1.002 | 1.001 | 1.876 | -0.404 | 1.007 | 0.668 |
| TMSS | -0.742 | 0.876 | 0.476 | -0.961 | 0.822 | 0.383 | -0.260 | 0.740 | 2.171 |
| | Amount of Loan Range (Tk.) (m: 5000-10000) | | | | | | | | |
| 11000-20000 | 0.043 | 0.480 | 1.044 | 0.959* | 0.550 | 2.410 | 0.666 | 0.504 | 1.946 |
| 21000-30000 | -0.656 | 0.712 | 0.519 | 0.303 | 0.748 | 1.354 | 0.097 | 0.675 | 1.102 |
| Above 30000 | -1.342* | 0.723 | 0.211 | 0.189 | 0.718 | 1.208 | 0.691 | 0.648 | 1.996 |
| | Main means of asset change (m: micro-credit only) | | | | | | | | |
| 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 and business etc.) | 0.079 | 0.507 | 1.082 | -0.838* | 0.495 | 0.433 | -1.312*** | 0.434 | 0.269 |

Note: m refers reference category; levels of significance are =* $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$, respectively; β denotes the regression coefficient, and SE denotes the standard error of the regression coefficient.

Table 3

Percentage change in poverty situation; adjusted predicted probabilities (percentage) from the multinomial logistic regression model

| List of NGOs | Unaltered (m) | Marginal | Adequate | Healthy shift |
|--|---------------|----------|----------|---------------|
| BURO | 46.5 | 22.8 | 8.50 | 22.2 |
| GB | 36.6 | 28.5 | 16.6 | 18.3 |
| ASA | 52.2 | 20.6 | 9.60 | 17.6 |
| TMSS | 48.0 | 30.8 | 11.0 | 10.2 |
| BRAC(m) | 41.2 | 31.0 | 16.1 | 11.7 |
| Amount of Loan Range | | | | |
| (m: 5000-10000) | 41.2 | 31.0 | 16.1 | 11.7 |
| 11000-20000 | 38.8 | 28.7 | 19.1 | 13.4 |
| 21000-30000 | 28.8 | 23.8 | 34.9 | 12.5 |
| 30000 and above | 29.7 | 14.9 | 28.3 | 27.1 |
| The main mean of asset of change | | | | |
| Micro-credit with Others | | | | |
| (agriculture and business etc.) | 16.8 | 52.8 | 22.2 | 8.2 |
| Others (Agriculture and business etc.) | 45.7 | 39.3 | 7.2 | 7.8 |
| (m: Micro-credit only) | 41.2 | 31.0 | 16.1 | 11.7 |
| Taken before loan | | | | |
| Yes | 7.5 | 13.9 | 27.8 | 50.8 |
| No (m) | 41.2 | 31.0 | 16.1 | 11.7 |

Note: m indicates reference category

Different organizations have essential impacts on poverty alleviation in this study. As member of ASA, the likelihood that the respondents poverty position as not changed (remained the same) rises by 10.7%. The probability of respondents who do not have any change (unaltered) in their poverty situation increases by 10.7 percent if they belong to ASA. The probability of respondents having no change (unaltered) in poverty increases by 5.3 percent if the respondent came from BURO and 6.8 percent came from TMSS. A significant decrease in the probability of respondents having no change (unaltered) in their poverty situation is found in the respondent belonging to GB (36.6 percent). The probability of respondents who marginally overcame the poverty situation increases if the respondents are involved in BURO, GB, ASA & TMSS (by 9.2, 2.5, 10.4 & 0.2 percent). The probability of achieving adequate change in the poverty situation is much less than that of a BRAC member except GB. A remarkable 10.5 percent point increase in the probability of a healthy shift in poverty is observed if the respondents were

involved in BURO.

According to the current analysis, the amount of the loan has a substantial effect on alleviating poverty. The probability of respondents having no change (unaltered) and marginal change in poverty situation decreases, whereas the probability of an adequate and healthy shift in poverty situation increases if the respondent receives a loan of more than Tk. 5000-10000. If the respondent receives a loan above Tk. 30000, her probability of shift increases Healthy by about 15.4 percent point. If the loan amount increases, the probability of a healthy shift rises. The typical loan amount offered to new members by microcredit organizations ranges from Tk. 5,000 to Tk.15,000. More is needed to invest in an income-generating activity that can produce such earnings by paying weekly installments after mitigating all necessary family requirements (Haque & Yamao, 2009).

The analysis has shown that the primary means of asset change have significant effects. The probability of respondents who do not have any change (unaltered) in their poverty situation would increase by 4.5 percent if the primary means of asset change were others' mean rather than micro-credit. The probability of marginal change in the poverty situation has been increased by 21.8 percent points when the primary 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 money than those who received micro-credit. The probability decreases for the healthy shift in poverty situation by 3.9 percent points if the respondents use other means for their asset change. The probability of adequate change in poverty decreased by 8.9 percent when the primary means of asset change was other means rather than micro-credit. The findings imply that microcredit has some effect in reducing poverty. Such a conclusion backs up Khandker's (1998) research, which showed that microcredit activities are economically effective and produce a net surplus for borrowers in need.

Suppose the respondent took a loan before; his probability of achieving a healthy shift in poverty increases by 39.1 percent. The respondents who had previously taken out loans had experiences that helped them manage their loans more effectively and prevent potential losses. A study by Chowdhury, Ghosh and Wring (2005) suggests that microcredit has a potent effect on poverty alleviation.

7. Conclusion

The current study examined the potential effects of micro-credit programs of five NGOs on alleviating poverty in Bangladesh. First of all, this study measured poverty change based on respondents' perceptions. Finally, based

on changes in assets and educational attainment of the household, this study developed a substitute measure of poverty change. This survey found that the perceived change in poverty was 78.1 percent. However, the examination of the poverty change index (PI) indicates that around 55.6% of the respondents had successfully overcome their poverty position. The main contributing factors for changing the poverty situation revealed from the analyses were the amount of loans, different organizations, satisfaction level, taken loan before, and main means of asset change (mainly micro-credit). The results specifically suggest that the smallest loan amount should be increased to TK 30000-50000 for sustainable business, and proper field visits and other potential means should be used to boost the satisfaction of the customer. According to analysis, there are some villages where clients are performing differently from those of other villages. This indicates that some aspects of the communities differ amongst the villages. These may include the percentage of people who are aware that microcredit is available, the literacy rate, the communication network, the level and severity of poverty, the main occupation of household heads, the general attitude and behavior of the clients, and the drive and sincerity of the officials of the organizations in the communities. To speed up the process of reducing poverty in the areas where microcredit is still performing poorly, more research should be done to identify and prioritize the community features. Though micro-credit programs in Bangladesh have a positive impact in alleviating poverty, it has varying effects for different organizations. The approach recommended by Islam (2021) is based on various assessment factors, including the client's awareness of the actual interest rate, the fieldworker's visit, the client's request, and the client's ability to repay the loan. The perception of loan affordability, client satisfaction, the effect of microcredit on the reduction of poverty, and the program's operating costs may be utilized to determine best practices.

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