

Investigating the Role of Microcredit on Agricultural Output in Rural-Bangladesh

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Abstract

Microcredit or Microfinance is being considered as one of the investment-sources for local farmers who want to cultivate their land. It is highly difficult for local-farmers to collect fund for field-level investment, these farmers select micro-credit loan for seasonal-basis. The research-study attempts to explore the impact of microcredit on agricultural output. Based on a stratified random sampling technique, a total of 200 farmers in the south-west region of Bangladesh are surveyed to address the study objective. Half of the surveyed farmers are microcredit borrowers, while the rest are non-borrowers. The study findings indicate that the average agricultural output of microcredit takers is significantly higher than that of the microcredit non-takers. In the multiple regression model, educational status (ES), land Size (LS), Total Family Income (TFI), Micro-credit takers has positive and significant connection with agro-output. Inversely, yearly Family expenses affects negatively on agro-output. Within this research, ES and LS are statistically significant at 1 percent level. The author considers dummy variables as microcredit takers or non-takers, micro-credit taking farmers produce more agricultural-output compared than non-takers. A long-term sustainable agricultural-policies and green-cultivation are the major challenges for farmers.

Keywords: Microcredit, Agricultural output, Borrower, Non-borrower, South-west region of Bangladesh

Introduction

Microcredit, a financial intervention, was introduced in Bangladesh in the 1970s. It refers to the provision of small loans for income generating self-employment activities. It is defined as: 'Microcredit, or microfinance, is banking the non-banking, bringing credit, savings and other essential financial services within the reach of millions of people who are too poor to be served by regular banks, in most cases because they are unable to offer sufficient collateral. In general, banks are for people with money, not for people without (Maanen, 2004). Grameen bank was the first organization which introduced such type of credit in Bangladesh in mass scale. The main objective of a microcredit program is to reduce the poverty and to generate income for the poor people. Poverty rate has been reduced from 49 percent in 2000 to 40 percent in 2005, propelled by sequential economic growth and relatively stable inequality (Khan and Rahaman, 2007). Microcredit programs target landless and poor women. About 90 percent of the microcredit recipients are women (Islam, 2007). The loans sanctioned by the microcredit providers are collateral free and usually have a maturity period of 50 weeks with weekly repayment (Khawari, 2004).

Generally, there is no special focus on any specific sector of the microcredit programs. It is given as agricultural, rural, cooperative or consumer credit. After the success of the Grameen bank in the field of microcredit, various types of organizations, such as Bangladesh Rural Advancement Committee (BRAC), Association for Social Advancement (ASA) and PROSIKA come forward to provide microcredit to the poor people of Bangladesh. These organizations introduce microcredit to reduce poverty from the society, empower the women, provide free education to the children, accelerate family planning and facilitate women health care. These organizations also support the government's poverty reduction efforts. In most cases, credit borrower women have been able to

gain some sort of access to land and other assets. In case of agricultural sector, the borrowers take loans for firming activities, including beef fattening, vegetable growing, fish culturing and betel leaf cultivation. Here, the concerning issue is to quantify the impact of that microcredit on agricultural output. This study specifically tries to figure out the impact of microcredit on agricultural output.

Literature Review

Immediately after the independence of Bangladesh, a number of NGOs emerged to confront the challenges and the devastating condition of a newly born country. NGOs began to put greater emphasis on the development of the country through microcredit programs (Pine, 2010). The available literature also describe the role of NGO provided microcredit programs in women empowerment, improving living condition, creating job opportunities, income generation, health care, poverty reduction and overall well-being of the credit borrowers. For example, according to Banu and Farashuddin (2001), BRAC has been able to bring about substantial changes in the lives of its programme participants, in terms of facilitating their material, perceptual and relational empowerment, both at the individual and family levels. Sopheana et al. (2006) demonstrate that microcredit plays an important role in changing living condition of households through increasing income, asset and job opportunity.

Nawaz (2010) reports that the opportunities created by credit availability help poor people to invest in their own businesses, educate their children, improve their healthcare and promote their overall well-being. Cheston and Kuhn (2002) argue that microcredit programs have the 'potential' to transform power relations and empower the poor, both men and women. Islam (2007) narrates a positive impact of microcredit on enterprise, household income, asset accumulation and household consumption. Priya (2006) found that there is a significant positive relationship between credit recipients and output. It has a great effect on the economic and social well-being by proper utilization of the credit in productive sector.

Microcredit alone cannot serve the farmers and take them out of poverty, rather it is one of the elements on the possible interventions to generate income, create employment, improve living standard and possibly alleviate poverty (Khan and Rahaman, 2007). Sachs (2009) claims that microcredit may not be an appropriate tool in every sector. In contrast, Sarumathi and Mohan (2011) narrates microcredit as one of the most important tools through which low-income people can escape poverty. It serves as a means to empower the poor, and provides a valuable tool to assist the economic development process. Microcredit is the most important tool through which low-income people can escape poverty (Sarumathi and Mohan, 2011).

According to Chowdhury et al. (2002), the effectiveness of microcredit as a poverty alleviation tool depends on its capacity to contribute in a sustainable increase of a household's ability to wealth creation. Khan and Rahaman (2007) report that microcredit recipients had empowered themselves and become very active participants in the economy to contribute the economic growth. Morrison et al. (2007) highlight on the importance of education level of the credit recipients for getting optimal benefit from microcredit uses. However, Karnani (2007) argues that although microcredit yields some non-economic benefits, it does not deeply alleviate poverty and that the promise of microcredit is less attractive than the reality.

According to the reviewed literature, the success of microcredit is well reported in several studies in broad areas, such as poverty alleviation, group-based lending, women empowerment, sustainability and outreach. Nevertheless, a detailed study to address the credit needs of small and marginal farmers for certain perceived problems, such as the risk of investment in agriculture, seasonality of agricultural production, poor loan repayment performance, and the uncertainty of agricultural production is scarce in the literature. Though it is evident that microcredit institutions have come forward to assist the farmers, but the impact of microcredit on farm output is not yet explored in details. More specifically, a detailed study on the study topic in the south-west region of Bangladesh is scarce in the literature. Thus, this study attempts to figure out the impact of microcredit on agricultural output from the perspective of the south-west region of Bangladesh.

Mahfuza et al. (2016) mentioned that the importance of micro-credit affects rural poverty through agro-productivity, agricultural sector credit, rural employment, female employment, agricultural production varies for micro-finance. Rahman and Bhuiyan (2022) highlighted a research based on microfinance and women empowerment through BRAC finance. Chowdhury (2023) defined that how micro-finance affects Socio Economic Status and Employment in Rural-Bangladesh. Jahan (2024) highlighted a paper based on agricultural loan in farmers for seasonal agro-products. Agricultural-loan can affect agro-productivity in regional-basis, where microfinance can affect positively on corn and cotton production in Pakistan (Ahmed and Ali, 2023). Denis (2021) mentioned that how micro-finance affect family-farm productivity in Benin, family farming has positive connection with microfinance in agro-products.

Namayengo (2017) developed a paper based on the effect of micro-finance on women contribution and production capacity for household food-security. Yuko (2020) developed a research impact of microcredit on

agricultural technology adoption and productivity in Tanzania.

Research Objective

To investigate the impact of microcredit on agricultural output, on consumption and agro-production and also to know the impact of agricultural output on livelihood pattern of microcredit takers and non-takers

Research Questions

1. *What is the impact of microcredit on agricultural output?*
2. *What is the impact of microcredit on consumption of the microcredit takers?*
3. *What is the impact of agricultural output on livelihood pattern of microcredit takers and non-takers in the study area?*

Research Finding and Discussion

Agricultural output depends on some variables such as land amount, labor use, season, crop type, credit, fertility of land, availability of pesticide and insecticide. Among these, this study specifically focuses on the role of capital which is an important input in the agricultural production system. Since most of the sample farmers in the study area are poor, they are willing to get credit for running agricultural activities. The traditional financial institutions including banks demand collateral before approving credit applications. However, the poor farmers often fail to comply with the collateral needs. Under the said circumstances the collateral free loan provided by the non-governmental organizations (NGOs) acts as a blessing for the poor farmers. The concerning issue is how much of the granted loan is utilized in agriculture sector. This study also tries to quantify the impact of microcredit on agricultural production.

The summary statistics of the important variables of this study are reported in Table 1. According to Table 1, most of the surveyed farmers are of middle age having a longer period's farming experience on an average, although they are not that much educated (Table 1). Average family income and expenditure are about BDT 4,000 and 3,000 respectively. They have agricultural microcredit burden of about BDT 11,000 on average. Through using the credit, they produce 2080 Kg rice per bigha on average in their crop lands (Table 1).

Table 1: Estimation the Effect of Independent Variables on Dependent Variable

Symbol	Variable Name	Variable Description	N	Mean	SD	Min	Max
A	Age	Years	200	46.32	11.00	25	75
ES	Educational status	Years of schooling	200	7.05	3.15	0	15
FE	Farming experience	Years	200	13.88	8.31	2	40
LS	Land size	Bigha	200	4.93	5.50	0.50	31
FS	Family size	Number of member	200	5.38	2.37	2	12
FENJ	Family employment	Number of member	200	1.88	1.19	1	7
T	Training	Dummy: Yes=1, Otherwise=0	200	0.40	0.49	0	1
TFI	Family income in a crop year	BDT (thousands)	200	48557.50	27346.70	10300	146000
FEY	Family expenditure in a crop year	BDT (thousands)	200	38207.50	21328.93	5000	100000
NF	Nature of farming	Dummy: Full time=1, Otherwise=0	200	0.43	0.50	0	1
D	Microcredit dummy	Dummy: Taker=1, Non-taker=0	200	0.50	0.50	0	1
TCA	Microcredit amount	BDT (thousands)	200	11150.00	14282.65	0	50000
Q	Output	Mound per Bigha	200	51.87	40.07	8	200

Note: 1 Mound = 40 Kg

Source: Authors' compilation based on field Survey, 2025

Since this study is concerned to check whether there is any significant difference in agricultural output between the microcredit borrowers and non-borrowers, the corresponding null hypothesis is:

Ho: There is no statistically significant difference of agricultural output between microcredit takers and non-takers.

Table 2: Output Difference between Microcredit Takers and Non-takers

Output (Maund per Bigha)	Mean	Standard error	t-value	p-value
Microcredit takers	61.43	8.75	1.89	0.06
Microcredit non-takers	42.30	5.10		
Difference	19.13	10.13		
Note: 1 Maund = 40 Kg				

Source: Authors' compilation based on field Survey, 2025

According to Table 2, the mean agricultural output of microcredit takers is 19 maund per bigha higher than that of non-takers in a crop year and the said difference is statistically significant at 10 percent level of significance. Moreover, mean comparison between microcredit taker and non-taker groups for other socioeconomic characteristics, such as age, experience, land size, family size and income didn't find any statistically significant difference between the considered two groups which advocates that the two sets of samples for the microcredit taker and non-taker groups are almost homogeneous. Hence, according to Table 2, it may be argued that the average agricultural output for microcredit takers is significantly higher than that of non-takers and this difference is statistically significant.

This study also uses a multiple regression (Equation 1) to understand the impact of microcredit on agricultural output. The estimation results are reported in Table 3. Age, family size, educational status, land size, farming experience, family expenditure, family income, nature of farming, training, family employment and microcredit dummy are the explanatory variables, whereas agricultural output is the dependent variable.

$$Q = \theta_0 + \theta_1 A + \theta_2 ES + \theta_3 FE + \theta_4 LS + \theta_5 FS + \theta_6 FENJ + \theta_7 T + \theta_8 TFI + \theta_9 FEY + \theta_{10} NF + \theta_{11} D + u \text{ ----- (1)}$$

Table 3: Multiple Regression Analysis Results of Independent variables on Dependent variable

Variables	Coefficient	Standard Error	Literature
A: Age (Years)	0.33	0.45	Angelucci et al, 2015
ES: Educational status (Years of schooling)	2.89**	1.16	Lu and Hasan (2011)
FE: Farming experience (Years)	0.00	0.61	Sultana and Hasan (2010)
LS: Land size (Bigha)	2.57***	0.80	Sopheana et al. (2006)
FS: Family size (Number)	2.02	2.19	Banerjee et al, 2015
FENJ: Family employment (Number)	-3.57	4.50	Afrin et al. (2008)
T: Training (Dummy, Yes=1, Otherwise=0)	-8.11	7.65	Hamdan et al. (2012)
TFI: Family income in a crop year (Thousand BDT)	0.00***	0.00	Parveen and Chaudhury (2009)
FEY: Family expenditure in a crop year (Thousand BDT)	-0.00**	0.00	Crepon et al, 2015
NF: Nature of farming (Dummy, Fulltime=1, Otherwise=0)	-9.22	7.50	Tarozzi et al, 2015
D: Microcredit dummy (Takers=1, Non-takers=0)	14.94*	8.38	Author's compilation
Constant	-35.68*	20.33	
N	191		
R²	0.68		
Adjusted R²	0.60		
Significance Level: *p<0.1; **p<0.05; ***p<0.01			
Dependent variable: Agricultural Output (Mounds per bigha). Note: 1 Mound = 40 Kg			

Source: Author's compilation based on field Survey, 2025

According to Table 3, educational status, land size, family income, family expenditure and microcredit dummy variables have statistically significant influence on agricultural output. The coefficient of microcredit dummy

indicates that the average agricultural output of a microcredit taker is significantly higher than that of a microcredit non-taker and this statement is statistically significant at 10 percent level of significance. Moreover, educational level, land size and family income have statistically significant positive impact on agricultural output while family expenditure has statistically significant negative impact on agricultural output. The R^2 value of the estimated model is also high, 0.60 which denotes that about 60 percent of total variation in agricultural output is explained by the considered explanatory variables.

Research Findings

Most of the farmers obtain credit from non-government organizations and very few farmers obtain credit from government organizations because from NGOs it is easily available without any collateral. The farmers also take credit from local money lender. But the interest rate is high from non-institutional sources. Land size, family income and educational status also contribute to enhance farm productivity significantly. Labor and capital are the most vital variables among both microcredit takers and non-takers while total microcredit amount and family expenditure affect farm productivity negatively. There is statistically significant difference between microcredit takers and non-takers with respect to output level and consumption expenditure. There is much difference that is the average 19 mounds per bigha per crop year. Most of the microcredit takers pay back 61-70 percent loan with interest before getting return from investment. A few farmers pay back the loan after getting return. But they take loan from non-institutional sources and have to pay high interest rate. The farmers require credit to enhance productivity. The farmers with access to microcredit increase their output, but they do not get much facility. Because they do not get convenient gestation period for proper cultivation between taking loan and getting return from investment. On the other hand, uneven interest rate system is another important hindrance of depriving from the facilities of output differential. Besides, most of the farmers are not aware at the utilization of credit in agricultural sector. Most of the farmers cultivate their own land. Besides, they also cultivate rental land. Microcredit taker farmers cultivate more rental land than non-taker farmers because they become affluent to rent the land. About 62.5 percent farmers think that they require more time to pay back the loan because it would be better for them if they pay it after getting output.

Policy Recommendation

It can be concluded that the takers of microcredit are not as productive as expected, even though they have the potential to be more productive than they currently are. Therefore, to enhance the productivity of the microcredit takers as well as that of non-takers, the followings can be suggested. Most of the farmers take credit from NGOs. But they have to pay back the loan from the first week of taking loan. So, they cannot use it properly. NGOs should make a provision for giving a convenient gestation period for agriculture credit and providing loan in different phases of cultivation. Otherwise the loan takers fall in loan trap. The farmers should ensure that they utilize the credit facilities for the farm production purpose for which they have taken the loan. Government organizations should make their service available in the form of provision of credit facilities for the small scale farmers and make it easy for the farmers to collect the loan without any collateral. Since it is obvious that microcredit non-taker farmers need credit for production, the farmers should make optimal use of chances available within the environment by taking loan from NGO and relatives and try to take loan from the sources whose terms and conditions are low. Procedure for acquisition and recovery of credit should be made easy so that maximum number of farmers can get benefit from it. The monitoring and credit system should further be improved so that the miss-utilization of the credit by the farmers is minimized. It will be better if the credit is provided to the farmers in the form of kind (seed, fertilizer, pesticides); because it will prevent them from consumption of loan and Mobile Credit Officers (MCOs) should visit the borrowers' farmers regularly and provide the required technical assistance to them.

Capacity Building Programs: For involving in agricultural sector and implement different activities must be need enhance capacity-building. So, programs targeting women in agriculture to enhance their skills and knowledge.

Access to Resources: Advocate for policies and programs that improve women's access to resources such as land, credit, and technology. All they will get from these.

Community Engagement: Establish community-based forums to openly discuss and challenge prevailing norms contributing to participate in agriculture sector. Engage advance level farmer, buyer, sub lead farmer in different way. Besides, awareness session programs to challenge stereotypes and promote gender equality in agriculture.

Institutional Support: Need to strengthen different institutional support systems for women in agriculture, including extension services and farmer cooperatives. Including support from government is important.

Regular monitoring and Data Collection: Establish a systematic monitoring and evaluation mechanism to assess

the effectiveness of interventions over time. Regularly collect and analyze data to track changes in women participation in agricultural side in coastal area.

Conclusion

Agriculture based rural farming is the central focus of Bangladesh economy. About three-fourths of the people of the country live in rural areas. Agriculture is the main source of income of those rural people. Most of them need credit for smooth running the agricultural activities. Because of being poor, the farmers collect money from different sources and one of the easily available sources of money is the microcredit of NGOs. This study tried to trace out the impact of this microcredit on agricultural output.

After getting the loan, the farmers had to think for the installment payment in due time. In most cases, they had to pay the first installment in the first week of taking the loan. As a result, most of the borrowers pay it from the loan amount. Hence, that amount does not provide any benefit to the borrowers. Among the surveyed 30 credit borrower farmers, 23 said that they paid the first installment from the loan amount. Since the microcredit provider NGOs don't allow any gestation facility, the borrowers sometime had to borrow from other sources to pay the installments. In this way they fall in microcredit loan trap. Moreover, some loan takers spend the borrowed money in some unproductive sectors such as housing, marriage of their children and consumption.

The study findings indicate that there is a statistically significant output difference between the microcredit takers and non-takers. Per bigha agricultural output is about 19 mounds higher for the microcredit takers in comparison with non-takers in a crop year, which signals that access to credit facilitate the farmers to timely manage the required inputs by dint of microcredit which is reflected in the output differentials. The said output difference is statistically significant at 10 percent level of significance. The regression results also indicate that the agricultural output is significantly higher for the microcredit borrowers in comparison with non-borrowers and the said difference is also statistically significant at 10 percent level of significance. Therefore, it may be concluded that microcredit has a significant positive impact on agricultural output.

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