



## Agricultural Credit and Profitability of MV Boro Rice Cultivation at Farm Level in Some Selected Areas of Chapai Nawabganj District

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### ABSTRACT

Agricultural credit program is considered as the significant change-maker in the rural and subsistence agriculture sector of Bangladesh. Attainment of the agricultural credit program typically relies on the disbursement process, effective utilization as well as the profitability of the ultimate users. Therefore, an investigation was conducted at Sadar and Nachol Upazila under Chapai Nawabganj district to assess the amount of requirement and disbursement situation of credit; evaluate the cost of getting credit and its utilization patterns; measure the profitability of credit borrowers; and find out the constraints of getting credit by different farm categories to get a detailed insight about successful attainment of the credit program on modern variety (MV) Boro rice cultivation. A total of 120 borrower farmers belonging equally to small, medium and large categories of farm who took a loan from Rajshahi Krishi Unnayan Bank (RAKUB) were interviewed in 2018. Descriptive statistics as well as tabular analysis were used to analyze and interpret the data. The findings revealed that on an average RAKUB fulfilled 77% of the total credit requirement of Boro rice farmers in the study areas. Borrowers had to pay on an average Tk 12.18 for getting hundred taka loans where small farmers had to pay the highest followed by medium and large farmers, respectively. Small, medium and large farmers used 48, 35 and 23 percent of borrowed money, respectively, for Boro rice production and the rest were used for family consumption and other purposes. Medium farmers were found to be more profitable followed by large and small borrower farmers, respectively. Insufficient amount of credit, higher non-interest cost of institutional credit as well as long and complex institutional procedure of loan disbursement was reported as main constraints by the borrowers. Findings highlight the inevitability of reformation of the current agricultural credit program to make it more user-friendly and an effective contrivance.

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### Introduction

Modern agriculture, being a capital-intensive venture, requires huge amount of investment. The demand for capital increases with the transformation of the agriculture sector from traditionalism towards commercialization (Sidhu *et al.*, 2008). Agriculture is still considered as the life-blood of the rural economy of Bangladesh which is also heading towards commercialization to cope up with increased demand. It is well documented that the recent technological breakthrough which was incepted by Green Revolution has not only resulted in increased productivity and output, but also brought about significant changes in the magnitude and structure of cost associated with the process of production (Alauddin and Biswas, 2014). Because the new technology is capital intensive, which is not affordable for small and marginal farmers who

represent the largest portion of the country's farming enterprises, have to depend on credit for financing the farm expenses. Agriculture sector depends heavily on credit due to seasonal variations in farmers' returns and a changing trend from subsistence to commercial farming. Due to their needs and the prevalence of the monopoly position of the creditors inherent to the non-institutional credit market, institutional credit is of prime importance for enhancing production and removing inequalities (Saha, 1985).

Recently, the government of Bangladesh has given much emphasis on agricultural credit to the farmers as to achieve sustainable self-sufficiency in food within shortest possible time. The extended Agricultural and Rural Credit Policy and Program have been introduced by Bangladesh Bank to ensure agricultural and rural credit

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disbursement without unnecessary hassle (GoB, 2017). Table 1 represents the annual target and actual disbursement of agricultural credit from 2010-11 to 2017-18 financial years.

Table 1: Annual target and disbursement of agricultural credit

Fiscal Year	Target (crore Tk)	Disbursement (crore Tk)
2010-11	12617.40	12184.32
2011-12	13800.00	13132.15
2012-13	14130.00	14667.49
2013-14	14595.00	16036.81
2014-15	15550.00	15978.46
2015-16	16400.00	17646.39
2016-17	17550.00	20998.70
2017-18	20400.00	21393.55

Source: Bangladesh Bank (2018)

It is apparent from the table that every year the annual target as well as disbursement of agricultural credit is being increased significantly. In 2010-11 fiscal year the target of agricultural credit was Tk 12617.40 crore which increased to Tk 20400.00 crore in 2017-18. On the other hand, in 2010-11 the actual disbursement was 97% of the target which increased by 105% in the fiscal year 2017-18 (Bangladesh Bank, 2018). Therefore, it can be said that government is focusing more on agricultural credit program by considering it as an essential tool at subsistence level to ensure and sustain food security.

In order to keep pace with the growing demand for food and to attain sustainable food security of the country, rice production is to be increased through more improved technologies, intensive input use and making the farming profitable at the same time. Moreover, the MV Boro rice cultivation is highly input intensive ventures in the new agricultural systems which often lead the farmers to gain very limited profit sometimes even loss or zero profit. Consequently, farmers are unable to accumulate enough capital to buy the costly inputs needed for Boro rice cultivation. Early studies indicated that to sustain and accelerate technological change in agriculture for adopting improved practices, credit is essential (Hossain, 1988). Similarly, Alauddin and Biswas, (2014) observed that although rich and middle-class farmers generate sufficient surplus after maintaining a higher standard of living, they too feel the need for credit in certain period, particularly in Boro seasons.

In Bangladesh, farmers take loan both from formal and informal sources. Farmers, particularly in Chapainawabganj area take institutional credit for MV Boro rice cultivation from Rajshahi Krishi Unnayan Bank (RAKUB) as it is one of the state-owned key specialized and well-structured banks for agricultural credit disbursement in the northwest part of Bangladesh. It is often assumed that the credit taken for agricultural

purposes, i.e. MV Boro rice cultivation is not solely used for the purpose. Therefore, when a loan is advanced to the farmer, they use it according to their priority of needs. On the other hand, there are some unwanted cost involved for obtaining agricultural credit (Miah *et al.*, 2006). For getting a better insight about the agricultural credit program it will be more appropriate to reveal the actual state of different categories of farmers by addressing following questions such as how the credit is obtained? How obtained credit are being used? What are the constraints belong to the process? By considering different farm category in case of addressing the above questions will also provide a comparative as well as precise scenario which may help to draw essential policy decisions for the specific group of farmers. It is to be mentioned that this kind of study by addressing different farm category is quite absent in the country's context. Therefore, considering the aforementioned facts, this study is being carried out with the specific objectives to i) assess the amount of requirement and disbursement situation of credit of different categories of farm; ii) evaluate the cost of getting credit and its utilization patterns by different farm types; iii) measure the profitability of credit borrowers by different farm type; and iv) find out the constraints of getting credit.

#### Materials and Methods

The study was conducted in Sadar and Nachol upazila of Chapai Nawabganj district, which were selected purposively as the two respective branch of RAKUB of those two aforementioned upazila's disbursed highest amount of credit on MV Boro cultivation in 2017. At the outset, a list of 120 credit borrower farmers (40 small, 40 medium and 40 large) from each upazila was taken from Chapai Nawabganj and Nachol branches of RAKUB. Then, 20 small (0.05-2.49 acres), 20 medium (2.50-7.49 acres) and 20 large (7.50 acres & above) credit borrower farmers were selected randomly from each upazila. Thus, a total of 120 (40 for each small, medium and large category) credit borrower farmers were interviewed directly with a structured questionnaire during the Boro season, 2018. Collected data were then summarized, tabulated and analyzed in accordance with the objectives. Descriptive statistics as well as tabular analysis were used to analyze and interpret the data. In this study, cost and return analyses were done on both variable or cash and full cost basis.

The profitability of Boro rice was estimated applying the conventional profit equation as follows.

$$\Pi = TR - TC \dots\dots\dots (1)$$

Where,  $\Pi$  = Net return (Tk/ha); TR= Total return (Tk/ha); TC= Total costs (Tk/ha).

Thus, the model can be written as:

$$\Pi = \sum Q_y \cdot P_y + \sum Q_b \cdot P_b - \sum_{i=1}^n (X_i \cdot P_{xi}) - \text{TFC}$$

Where,  $Q_y$  = Total quantity of (paddy) output (kg/ha);  $P_y$  = Per unit price of (paddy) output (Tk/kg);  $Q_b$  = Total quantity of the concerned byproduct (kg/ha);  $P_b$  = Per unit price of the relevant byproduct (Tk/kg);  $X_i$  = Quantity of the concerned  $i^{\text{th}}$  input;  $P_{xi}$  = Per unit price of the relevant  $i^{\text{th}}$  input; TFC = Total fixed cost involved in production process; and  $i = 1, 2, 3, \dots, n$  (number of inputs).

## Results and Discussion

### Credit requirement and disbursement

Table 2 shows the average amount of credit requirement by the borrowing farmers of three farm categories and actual disbursement for MV Boro rice cultivation in the survey areas. On an average, requirement of credit of Boro rice farmers was Tk 66,667 while the demand for credit of large farm type (Tk 100,000) was largely higher than that of small (Tk 35,000) and medium (Tk 65,000). Similarly, large farm received a higher amount of credit (Tk 81,800) compared to small (Tk 23,400) and medium (Tk 48,900) farm. It is to be noted that, the gap is lowest for the large farms which is more likely to happen as large farms have more resources or collateral to borrow money. On the other hand the requirement of credit is higher in case of large farmers as they often need huge investment to maintain a large farm e.g., buying machineries, irrigation facilities, etc. but on the contrary, they can avail limited amount of credit as there are some ceiling or credit limit which are being set by the amount of land which is limited to a certain extent under the provision of current agricultural credit policy. Another important finding from the results is that, RAKUB fulfilled on an average 77% of the total credit requirement of Boro rice farmers in the survey villages. However, an average gap between the required and received credit was about 23%, indicated that the sanction of credit was inadequate for the Boro rice production. The agricultural loan that are disbursed from institutional source are quite insufficient compared with the credit need of the farmer. Previous survey results among the farmers also support the argument (Sarker et al. 2006). Most of the cases it is due to the lack of required collaterals or ceiling of credit limit or complex rules set by the authority, which is also evident from past studies (Alauddin and Biswas, 2014; Sarker et al. 2006).

### Cost of credit

Table 3 shows item wise average cost of receiving hundred Taka loans from RAKUB in the study area. On

average the cost of receiving hundred Taka loan from RAKUB was Tk 12.18. Among the major cost items, official cost was significantly lower (e.g., application fee, 7%) than unofficial costs (93%). The entertainment cost (58%) was the highest among all unofficial cost followed by traveling (15%), food (12%) and labor cost for getting a loan (9%). Farmers mentioned that fulfilling an undue demand of brokers (*dalal*) and/or some unscrupulous bank officials covers significant percent of the sanctioned credit which itemized as entertainment costs in the analysis result. This cost is higher in case of small farmers and lowest in large farmers mainly because of the high social acceptance and impact of large farmers. Because of that they don't have to rely on brokers solely most of the cases and get the credit, comparatively easily than the small and medium farmers; and for the same reason some other unofficial costs like traveling, the labor cost of spending hours are also bit lower than small and medium farmers, respectively as large farmers had to merely visit the bank or brokers physically. On the other side, most of the small farmers have very poor knowledge about the rules and regulations; they feel very uncomfortable to deal about their credit directly with assigned bank personnel and rely utterly on brokers which ultimately force them to bear extra unofficial costs other than the application fee. It is to be mentioned that, Miah et al. (2006) also listed the above-mentioned items of costs for obtaining agricultural credit from Grameen Bank (GB) as well as RAKUB.

### Loan utilization patterns

Table 4 represents the utilization pattern of obtaining loan on MV Boro cultivation by different categories farms. It is observed that about 31% of total loans were invested in MV Boro rice production by all categories of farmers whereas small, medium and large farmers used 48%, 35% and 23% of their total loan, respectively. It is also apparent from the table that, paying wages to the labor was the most vital item for all categories of farms which is also in line with previous study (Miah et al., 2006). It comprised about 13% of the total borrowed funds in case of all farmers where 13%, 18% and 10% for small, medium and large farmers, respectively. It is to be noted that, small farmers spent their borrowed funds more on rice production, because they did not have any external sources of funds or their tiny piece of land/resources does not allow them to divert the loan they obtained on MV Boro cultivation to other productive or unproductive purposes. Non-rice crop (banana, potato, vegetables, etc.) production had been the next head of expenditure which accounted for 32% of total loan used by all categories of farm. Small, medium and large farmers used 17%, 39% and 32% of their total loan for expenditure on non-rice crop production, respectively.

Family expenditure comprises 11% of total loan used by all categories of farmers for various purposes. There was expectedly an inverse relationship between the size of the farm and the cost incurred for family expenditure which implies that small farmers had to spend some of their loaned money in meeting the basic necessities of life more than that of medium and large farmers. In general, 26% of total loaned money was spent on other non-farm expenditures such as repayment of old loans, investment in trade, petty business, bribe and so on. This kind of utilization was also observed by Miah *et al.* (2006). Large farmers spent relatively more on non-farm activities because they have access to invest in trade and other subsidiary occupations outside agriculture which may ensure higher return for them. Results clearly indicated that the farmers in the study areas are nowadays becoming more conscious regarding the productive use of loan (63%) and thereby increasing their farm income. However, utilization pattern revealed a significant finding for the policy-makers that farmers irrespective of their class, make diversified use of their credit though it is seasonal agricultural credit given for MV Boro rice cultivation. So, it is high time to reconsider the credit disbursement system; annual disbursement instead of the seasonal disbursement system may be proven more fruitful to the farmers as well as lenders.

#### Profitability

Table 5 presents unit cost of production of MV Boro rice by different farm types in the study area. It reveals that the variable cost for all categories of farmers were Tk 103,355 per hectare, whereas highest cost incurred by large farmers (Tk 105,522/ha) followed by small (Tk 103,513/ha) and medium (Tk 101,031/ha) farmers. It is also noted that wages of human labor and irrigation charge were the major cost items which covered almost 50% of total variable costs for all categories of farmers which is also in line with the overall costing pattern of Boro cultivation across the country whether farmers are credit borrowers or non-borrowers as reported by the literatures (BRR, 2017; BRR, 2018).

Table 6 shows the results of profitability analysis of small, medium and large farmers for MV Boro rice cultivation. The highest average yield received by medium farmers (6.29 t/ha) followed by large (6.01 t/ha) and small (5.99 t/ha) farmers, respectively due to better crop management like timely planting, weeding, application of fertilizers, adequate irrigation and relatively less post-harvest loss for comparatively better mechanization. Per kilogram production cost of MV Boro rice for small, medium and large farmers were Tk 22.91, 21.43 and 23.15, respectively. The reason which makes the large farm to incur higher production cost is extra dependency on hired labor. The gross return of medium farmers (Tk

161,816/ha) was higher than large (Tk 156,817/ha) and small (Tk 149,699/ha) farmers due to higher yield and lower production cost. Similarly, medium farmers received higher gross margin (Tk 60,785/ha) than large (Tk 51,295/ha) and small (Tk 46,186/ha) farmers due to efficient use of inputs to minimize production cost and higher market price of paddy. Furthermore, large and medium farmers received a higher price of paddy for not selling the marketable surplus immediately after harvesting; the ratio of benefit over cash cost (BCR) of medium farmers were higher (1.64) than those of large (1.52) and small (1.48) farmers. It is apparent from the study that borrower farmers irrespective to their categories make profit from Boro rice cultivation both in cash cost or full cost basis where many previous studies (BRR, 2017; BRR, 2018) argued about negative return of Boro rice cultivation especially in full cost basis.

#### Constraints

Table 7 depicts some constraints for getting a loan by sample farmers in the study areas. About 93% borrowers said that the allocation of RAKUB credit for each farmer was insufficient to meet up the cost of input intensive crop like Boro rice. Higher non-interest cost of institutional credit such as – application fees; stamp and documents cost; cost of traveling for loan negotiation and undue demand of unscrupulous bank officials/brokers as the entertaining cost act as hindrance to the development of their productive forces reported by 85% of total respondents. About 82% farmers mentioned that strong need for collateral in institutional sources in turn imposes many types of formalities on credit seekers that make them finally penchant for taking loan from semi-institutional and non-institutional sources though their interest rate is quite high. Difficult credit rules of banking institutions obstruct small and marginal farmers to access credit. Credit rules are very complicatedly formulated and, in many cases, these are not clearly apprehended by illiterate and partially educated farmers. The majority of farmers (63%) reported that the lengthy process of sanctioning credit is not only the barrier to applying inputs of the crop on time but also, they lost interest to apply for credit next time. About 53% farmers think that long institutional procedure as another impediment in securing loans from institutional source.

Absence of the effective regulatory framework, lack of appropriate employee and borrower's incentives, organizational and structural weaknesses, poor management systems can also be identified as the problem pertaining to the formal sector credit. In addition to that, lack of institutional cooperation has identified as one of the difficulties in accessing bank credit.

Table 2: Average requirement and disbursement situation of credit of different farm types

Farm types	Credit requirement (Tk)	Credit received (Tk)	Gap (Tk)
Small	35,000	23,400	11,600 (33)
Medium	65,000	48,900	16,100 (25)
Large	1,00,000	81,800	18,200 (18)
All Farmer	66,667 (100)	51,367 (77)	15,300 (23)

Note: Figures in the parenthesis are showing the percentages; Source: Field Survey, 2018

Table 3: Farmers cost of receiving hundred Taka loan from RAKUB

Items of cost	Small farmers	Medium farmers	Large farmers	All farmers
Application fee	0.80	0.80	0.80	0.80 (7)
Traveling cost	2.17	1.75	1.68	1.87 (15)
Food cost	1.15	1.41	1.75	1.43 (12)
Labor cost of spend hours	1.23	1.02	0.87	1.04 (9)
Entertainment cost	8.45	6.96	5.77	7.04 (58)
Total	13.80	11.94	10.87	12.18 (100)

Note: Figures in the parenthesis are showing the percentage; Source: Field Survey, 2018

Table 4: Loan utilization patterns of Boro rice farmers

Activities	Small farmers	Medium farmers	Large farmers	All farmers
<b>i) Rice Production</b>	<b>11,250 (48)</b>	<b>17,100 (35)</b>	<b>18,900 (23)</b>	<b>15,750 (31)</b>
Purchase of seed /Seedling	450 (2)	560 (1)	1,800 (2)	937 (2)
Purchase of fertilizer	1,150 (5)	1,400 (3)	2,400 (3)	1,650 (3)
Paying wage	3,110 (13)	8,700 (18)	8,550 (10)	6,787 (13)
Land Mortgaged in	2,375 (10)	-	-	792 (2)
Power tiller	1,045 (4)	1,140 (2)	900 (1)	1,028 (2)
Buying insecticides	775 (3)	1,350 (3)	1,500 (2)	1,208 (2)
Purchase of manure	545 (2)	1,250 (3)	1,100 (1)	965 (2)
Paying Irrigation charge	1,800 (8)	2,700 (6)	2,650 (3)	2,383 (5)
<b>ii) Non-Rice Production</b>	<b>4,050 (17)</b>	<b>19,250 (39)</b>	<b>26,550 (32)</b>	<b>16,617 (32)</b>
<b>iii) Family expenditure</b>	<b>4,200 (18)</b>	<b>8,000 (16)</b>	<b>5,000 (6)</b>	<b>5,733 (11)</b>
<b>iv) Others (Old loan repayment, investment, bribe etc.)</b>	<b>3,900 (17)</b>	<b>4,550 (9)</b>	<b>31,350 (38)</b>	<b>13,267 (26)</b>
<b>Total</b>	<b>23,400</b>	<b>48,900</b>	<b>81,800</b>	<b>51,367</b>

Note: Figures in the parenthesis are showing the percentage; Source: Field Survey, 2018

Table 5: Per hectare cost of MV Boro rice cultivation by farm category

Cost item	Farm category			All
	Small	Medium	Large	
Seedbed preparation (Tk/ha)	1,637	1,674	1,895	1,735
Seed (Tk/ha)	2,245	2,021	2,470	2,245
Human labour	46,780	47,934	49,078	47,931
Family labour	8,040	7,892	6,024	7,319
Hired labour	18,760	18,464	20,009	19,078
Contract	19,980	21,578	23,045	21,534
Land preparation cost (Tk/ha)	8,356	7,112	8,982	8,150
Fertilizer (Tk/ha)	13,268	12,805	14,560	13,544
Urea	5,149	5,425	6,047	5,540
TSP	3,892	3,480	3,769	3,714
MP	2,095	1,964	2,458	2,172
Gypsum	785	678	881	781
ZnSo <sub>4</sub>	1,347	1,258	1,405	1,337
Vitamin (Tk/ha)	1,496	1,309	1,601	1,469
Irrigation (Tk/ha)	21,556	20,557	18,071	20,061
Herbicide (Tk/ha)	449	687	907	681
Insecticide (Tk/ha)	5,613	4,870	5,804	5,429
Interest on operating capital 10% for five months	2,113	2,062	2,154	2,109
Variable cost (Tk/ha)	103,513	101,031	105,522	103,355
Land rent (Tk/ha)	33,681	33,681	33,681	33,681
Total cost (Tk/ha)	137,194	134,712	139,203	137,036

Source: Field Survey, 2018

Table 6: Profitability analysis of MV Boro rice cultivation by farm category

Item	Farm category			All
	Small	Medium	Large	
Yield (kg/ha)	5,988	6,287	6,014	6,096
Paddy price (Tk/kg)	23.50	24.25	24.50	24.08
Return from paddy (Tk/ha)	140,718	152,460	147,343	146,820
Return from Straw (Tk/ha)	8,981	9,356	9,474	9,270
Gross return (Tk/ha)	149,699	161,816	156,817	156,090
Variable cost (Tk/ha)	103,513	101,031	105,522	103,355
Total cost (Tk/ha)	137,194	134,712	139,203	137,036
Gross margin (Tk/ha)	46,186	60,785	51,295	52,735
Net return (Tk/ha)	12,505	27,104	17,614	19,054
Unit cost of production (Tk/kg)	22.91	21.43	23.15	22.48
BCR on cash cost basis	1.45	1.60	1.49	1.51
BCR on full cost basis	1.09	1.20	1.13	1.14

Source: Field Survey, 2018

Table 7: Constraints of getting loan

Constraints	% of farmers
Insufficient credit for the borrowers	93
Higher non-interest cost of institutional credit	85
Strong need for collateral in institutional sources	82
Difficult credit rules	75
Lack of timely loan assistance	63
Long institutional procedure	53
Poor institutional capability	45
Lack of institutional cooperation	32
Small and marginal farmers get less priority	28
No loan is sanctioned until repayment of previous credit	23

Source: Field Survey, 2018

Small and marginal farmers get less priority to allocate RAKUB credit and no loan is sanctioned until the repayment of previous credit were also identified as constraints that discouraged borrowers taking loan from institutional sources. Past literatures (Alauddin and Biswas, 2014; Sarker *et al.*, 2016; Khanam *et al.*, 2013) also enlisted similar factors as the constraints of agricultural credit in Bangladesh.

### Conclusion

Credit plays a crucial role in the cultivation of input-intensive crops like MV Boro rice. The Government of Bangladesh also takes this into consideration and therefore has taken the effort to boost up the agricultural credit disbursement system by gradually increasing the annual target as well as actual disbursement. Small farmers are given less precedence than medium and large farmers in case of credit disbursement which leads them to incur a substantial amount of money, most of which are off-the-record. Small farmers use the larger portion of authorized credit in rice production than medium and large farmers where cost of human labor was the most significant cost item for all categories of farms. Farmers belonging to a different level or class make diversified use of their credit round the year, though it is seasonal agricultural credit given to MV Boro rice cultivation. Medium farmers

harvested higher yield and higher price of paddy for better crop management as well as for not selling the marketable surplus immediately after harvesting. Furthermore, Boro rice cultivation was profitable endeavors for the borrower farmers irrespective of their categories. However, the amount of credit given to the farmer is still inadequate compared to their actual demand. High unofficial costs like undue privileges to the broker appears as a massive frustration for the borrowers. Furthermore, the complex loaning procedure as well as poor institutional capability is also affecting borrowers inversely and often let them go for non-institutional sources of credit. However, the sample size was one of the key limitations of this study which needs to be increased to formulate a concrete policy direction by more advanced research on this issue. The amount of credit should be fixed by the requirement of the borrowers whereas the entire loaning procedure should be made easier and user friendly. Government should take all necessary steps to remove illegal transactions during loaning procedure. In spite of some drawbacks, farmers in the study areas are nowadays becoming even more conscious about the productive use of the loan and thereby increasing their farm incomes which lead us to be optimistic about the prospect of seasonal agricultural credit in Bangladesh.

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## Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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