A COMPARATIVE PROFITABILITY ANALYSIS OF CREDIT AND NON-CREDIT USERS OF HYV BORO RICE CULTIVATION IN PAKUNDIA UPAZILA OF KISHOREGANJ DISTRICT

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BY

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CERTIFICATE

This is to certify that the thesis entitled **"A COMPARATIVE PROFITABILITY ANALYSIS OF CREDIT AND NON-CREDIT USERS OF HYV BORO RICE CULTIVATION IN PAKUNDIA UPAZILA OF KISHOREGANJ DISTRICT"** submitted to the Department of Development and Poverty studies, Sher-e-Bangla Agricultural University, Dhaka-1207, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE (MS)** in **DEVELOPMENT AND POVERTY STUDIES**, embodies the result of a piece of *bona fide* research work carried out by **NANDITA RANI SAHA**, Registration No. **11-04551** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that any help or source of information, received during the course of this investigation has been duly acknowledged.

Date: June, 2020

Dhaka, Bangladesh

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Supervisor

"Read in the name of your Lord who created"

Dedicated To

My Beloved Parents

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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 Pakundia Upazila under Kishoreganj 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 non-credit farmers; 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 High Yield Variety (HYV) Boro rice cultivation. A total of 60 farmers were interviewed in 2019. Descriptive statistics as well as tabular analysis were used to analyze and interpret the data. The study revealed that borrower farmers used more inputs and attained more returns through higher yield than their counterparts. The yields of rice per hectare were 10697.04 kg and 8985.64 kg for the credit and non-credit user farmers, respectively. The gross returns and net returns were Tk. 230280.83 and Tk. 98290 respectively, for the credit user farmers and Tk. 194385.90 and Tk. 69809.29 respectively for non-credit user farmers. The undiscounted Benefit Cost Ratio (BCRs) were 2.68 and 1.74 according to variable cost basis and total cost basis respectively in case of credit user farmers and 2.47 and 1.56 for the non-credit user. The findings also revealed that on an average Bangladesh Krishi Bank (BKB) fulfilled 77 percent of the total credit requirement of Boro rice farmers in the study areas. Borrowers had to pay on an average Tk 12.18 percent for getting 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. The study further reveals that credit could be judged as a vital player to increase higher yield through utilization of necessary production inputs and the inevitability of reformation of the current agricultural credit program to make it more user-friendly and an effective contrivance.

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ACRONYMS AND ABBREVIATIONS

BBS : Bangladesh Bureau of Statistics

BCR : Benefit-Cost Ratio

BRRI : Bangladesh Rice Research Institute

BINA : Bangladesh Institute of Nuclear Agriculture

DAM : Department of Agricultural Marketing

df : Degree of freedom

et al. : and others

Ep : Elasticity of Production

FY : Fiscal Year

GDP : Gross Domestic Product

ha : Hectare

IOC : Interest on Operating Capital

MoP : Murate of Potash

MT : Metric Tons

RTS : Return to Scale

SPSS : Statistical Package for Social Science

Tk. : Taka

TSP : Triple Super Phosphate

Kg : Kilogram

CHAPTER - I

INTRODUCTION

CHAPTER – I
INTRODUCTION

1.1 Background of the Study

In order to build a hunger and poverty free Bangladesh, the highest priority has been given to the development of agriculture and the welfare of the farmers. In the light of Vision 2021, 7th Five Year Plan, National Agricultural Policy 2018, Sustainable Development Goals, Deltaplan-2100 and other planning documents, the government is making all out efforts for the overall development of the agriculture sector. In FY2019-20, the target of food grains production is around 454.04 lakh metric tons (MT) which was 415.74 lakh MT in FY2018-19 (BBS, 2019). The global Corona virus (COVID-19) pandemic has affected the agriculture sector in Bangladesh too. Ensuring food and nutrition security for the large population of Bangladesh and protecting the lives and livelihoods of farmers, farm laborers and relevant others engaged in the agriculture sector are the main challenges now facing the agricultural sector given the forecast of imminent famine in the post COVID-19 world. In order to increase the productivity in response to the effects of COVID-19, subsidies on agricultural inputs have been increased, agricultural inputs have been made available and the scope of agricultural credit has been facilitated. Considering the significance of increased productivity of agricultural products, an amount of Tk. 9,000 crore was allocated in budget of FY2019-20 (National Budget, 2019-20) and Tk. 9,500 crore in FY2020-21 (National Budget, 2020-21) to provide subsidy on fertilizer and other agricultural inputs. On the occasion of Mujib year, Bangladesh Krishi Bank plays a leading role in agriculture. To fulfill the dream of father of the nation and to build hunger & poverty free Bangladesh, BKB has set a target of disbursing Tk 300 crore loan from bank's own fund at 7 percent interest (BKB website).

Bangladesh is a small developing country with mostly an agro-based economy. Agricultural sector plays an important role in the overall economic development and food security of this highly populated country. Historically, agricultural sector is prominent for a long time in Bangladesh (Molla et al., 2015). The agricultural sector (crops, animal farming, forests and fishing) contributes 13.65 percent to the country's total GDP and it remains as the largest employment sector in Bangladesh economy with about 40.6% of the labor force engaged in agriculture (BBS, 2019). Agriculture is a major source of rural jobs in Bangladesh as over 87 percent rural people derive at least

some income from agriculture (BBS, 2019). The contribution of agriculture to the GDP of Bangladesh is presented in Figure 1.1.

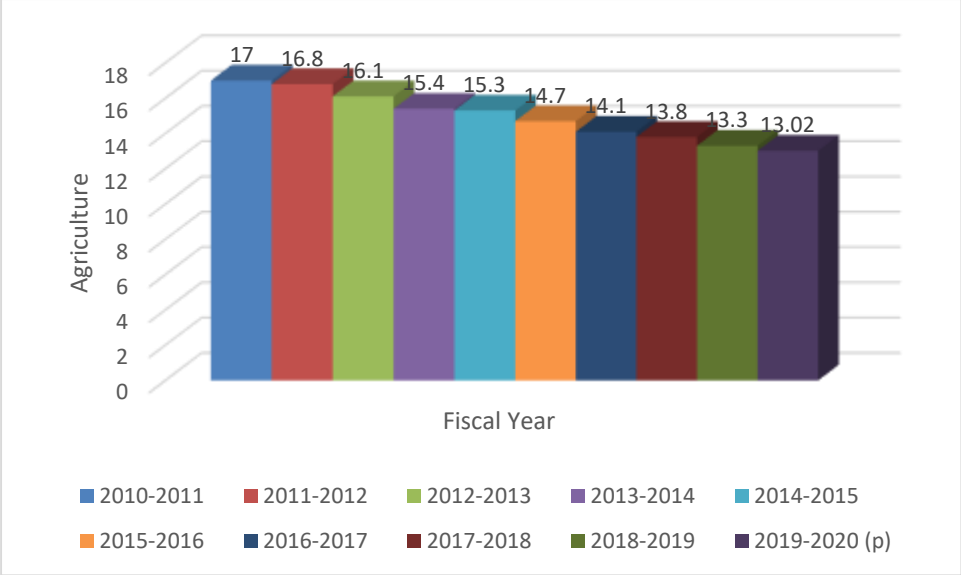

Figure 1.1. Share of Agriculture to GDP (%) of Bangladesh

P= provisional **(**Source: BBS, 2019)

Bangladesh is the fourth biggest rice producer in the world after China, India and Indonesia (DAM, 2017). Rice production is one of the main sources of revenue for the country's economy of agricultural sector in Bangladesh (Rahman, 2017). The significant contribution of rice in Bangladesh economy makes this crop very important among all agricultural crops because of making food sufficiency along with growing population.

Rice plays an important role in all spheres of life in Bangladesh and when it comes to food security of the rural farmers it is the most significant commodity in terms of livelihood and food. Bangladesh is trying to achieve self- sufficiency in food production from the time of independence (Rahman, 2017). According to government estimates, Bangladesh is self-sufficient in food production at present which is the result of increased rice production (Rab, 2017). The increased rice production has been possible due to the adoption of modern high yielding rice varieties.

There are many high yielding rice varieties. Among them the most popular high yielding and modern Boro varieties are BR-17 (Hashi), BR-18 (Shahjalal), BR-19 (Mongal), BRRI dhan 28, BRRI dhan 29 (Khan et al., 2011). Agriculture plays 13.41

percent to GDP in 2017 whereas the crop sub-sector contribution to GDP is about 7.3 percent alone (DAM, 2017). Bangladesh produces 3,265,000 MT rice (BBS, 2017). The highest share of rice production comes from Boro varieties (BBS, 2017). Boro rice is considered as the most important and single largest crop in Bangladesh in respect of volume of production (Hoque and Haque, 2014). Around 4,472,000 MT land is cultivated under Boro season and Boro rice varieties contribute to 54.56% of total rice production in Bangladesh (BBS, 2017). Thus, Boro rice plays a big part not only in the economy and livelihood of agriculture-based farmers but also in the total production, GDP and food security in Bangladesh. In the following table, share of Boro rice in the total rice production is presented in Figure 1.2.

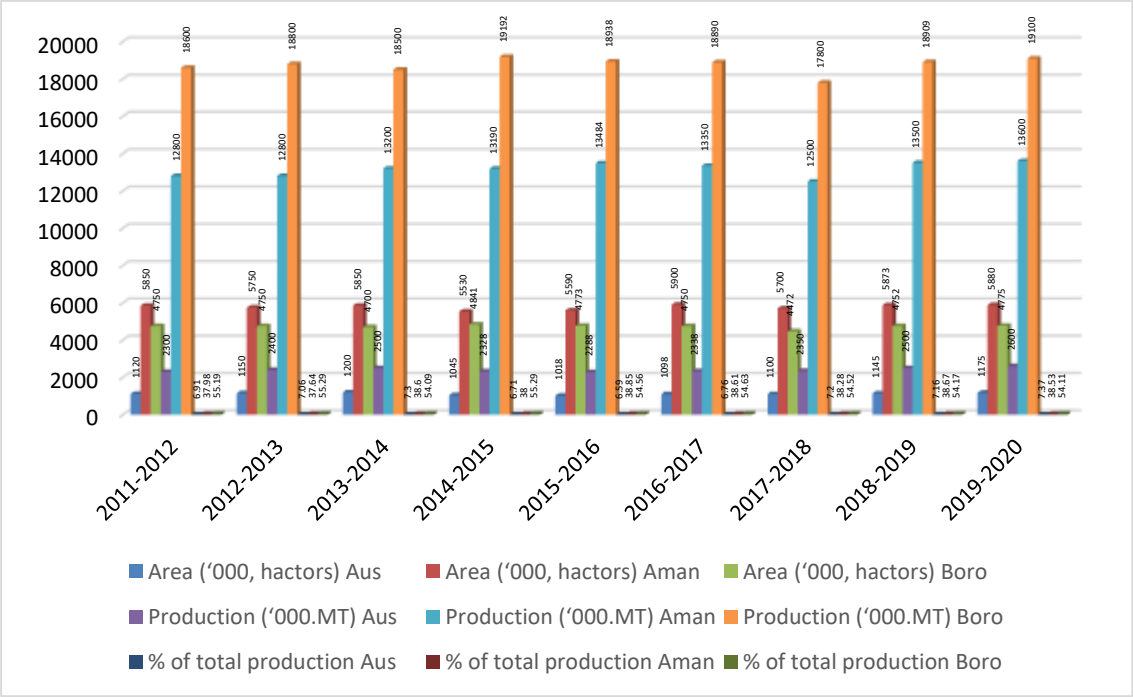

Figure 1.2. Share of Aus, Aman and Boro Rice Production to The Total Production
(Source: Bangladesh Economic Review, 2020)

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 lifeblood 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 noninstitutional 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 disbursement without unnecessary hassle (GoB, 2017). Table 1 represents the annual target and actual disbursement of agricultural credit from 2010-11 to 2018-19 financial years.

It is apparent from the (Table 1) 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 21800.00 crore in 2018-19. On the other hand, in 2010-11 the actual disbursement was 97 percent of the target which increased by 108.33 percent in the fiscal year 2018-19 (Bangladesh Bank, 2019).

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
2018-19	21800.00	23600.16

(Source: Bangladesh Bank, 2019)

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 HYV 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 Kishoreganj area take institutional credit for HYV Boro rice cultivation from Bangladesh Krishi Bank (BKB) as it is one of the state-owned key specialized and

well-structured banks for agricultural credit disbursement in Bangladesh. It is often assumed that the credit taken for agricultural purposes, i.e. HYV 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).

1.2 Statement of the Study

Rice is the main crop in our country. In getting the self-sufficiency on food production HYV Boro rice is so much helpful for our country. The production and profit from the Boro rice production is also greater than other rice like Aus and Aman. The farmer who get credit from financial institutions are more reliable to bear the cost of production than the non-credit users farmer. In this study, the profitability and problems of Boro rice production of credit and non-credit user's farmers has found. It also found that the constrains of farmers to get loan from financial institutions like Bangladesh Krishi Bank in Kishoreganj district.

1.3 Justification of the Study

Rice is the main cultivated crop all over Bangladesh. Rice is the major cereal crop in Bangladesh and highly related with food security. Though rice is being cultivated extensively in Bangladesh is much lower in comparison with other countries in the world. The average per hectare yield of HYV Boro rice is higher than Aus and Aman rice. But it is argued that the cost of production of HYV Boro rice is increasing day by day due to increase in the input price but the output price is not increased accordingly. It is also observed that farmers generally use different quantities of inputs depending upon their economic viabilities in producing HYV Boro rice. In that case agricultural credit is useful to increase their ability to bearing the cost of production during cultivation. Thus in many cases resources are not use efficiently.

Moreover, farmers have to face a lot of problems in producing HYV Boro rice and getting credit from bank like high input price, lack of capital and shortage of hired labor at the critical stage, lack of timely loan assistance, keeping this idea in mind, this study has been undertaken to get an insight into profitability of credit and non-credit users of HYV Boro rice cultivation.

1.4 Objectives of the Study

The specific objectives of this study are-

i. To identify the socio-economic characteristics of credit and non-credit users of Boro rice farmers.

ii. To access the relative profitability and estimate the major factors affecting profitability of Boro rice production.

iii. To identify the problems and obstacles faced by the farmers during production process and getting credit from the bank.

1.5 Organization of the Study

The study consists of seven chapters which have been organized in the following sequence. First chapter gives a brief introduction of the study. Chapter two presents a brief review of literatures related to the study. Chapter three gives an insight of the methodology used to complete the study. Chapter four describes the socio-economic characteristics of Boro rice farmers. Chapter five describes profitability analysis and factors affecting of Boro rice production. Chapter six describes problems and constraints faced by the farmers of Boro rice. Lastly, chapter seven presents the summary, conclusion and recommendation.

CHAPTER - II

REVIEW OF LITERATURE

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REVIEW OF LITERATURE

2.1 Literature Review

The main purpose of this chapter is to review some related studies in connection with the present study. Although a lot of studies have been done on Boro rice production only a few studies have so far conducted related to comparative profitability of credit and non- credit users of farmer. This study highlights only a few of the studies, which are considered recent and very relevant for this research. Again, some of these studies may not entirely relevant to the present study, but their findings, methodology of analysis and suggestions have a great influence on the present study, so it has great influence on the present study. Therefore, some of the literatures related to the present study are briefly discussed below:

Islam (2001) studied on economic potential of Bina-6 rice production in Mymensingh district with a sample of 55 farmers considering Cobb-Douglas production function and found that BINA-6 rice production was profitable because the total return was much higher than total cost of production.

Zaman (2002) showed a comparative analysis of resource productivity and adoption of modern technology under owner and tenant farms in a selected area of Dinajpur District. It was found that total cash expenses as well as total gross cost for producing HYV Boro rice were the highest in owner farms and the lowest in tenant farms. Owner operators used more hired labor where tenant operators used more family labor. The maximum return over total cost per hectare was obtained by owner operators and minimum by tenant operators and owner operators were more efficient than tenant operators. It was also found that the degree of adequacy level in the application of modern farm inputs were higher in owner farms than in tenant farms.

Anik (2003) studied on economic and financial profitability of aromatic and fine rice production in Dinajpur and Sherpur district with a sample of 100 farmers using Cobb-Douglas production function and found that aromatic rice was more profitable than fine rice as the net return was higher than fine rice.

Thakur (2003) studied on local Boro and hybrid Boro rice production in Brahmanbaria district with a sample of 60 farmers considering Cobb-Douglas production function and found that the net return of hybrid Boro rice was 15.04% higher than local Boro rice.

Shamsuddula (2004) studied on comparative economics of local Boro and Hybrid rice production in terms of profitability and efficiency in Mymensingh district with 160 samples of rice developing farmers using Cobb-Douglas production function and found that net return from Hybrid rice was much higher than local Bororice.The literatures show that Hybrid Boro rice was more profitable than local Boro varieties as the net return of hybrid Boro rice was higher than local Boro rice.

Siddiqui (2008) studied on economic profitability of BRRI Dhan-33 and BR-11 rice production in Kurigram district with 60 farmers using Cobb-Douglas production function and found that gross return for BRRI Dhan-33 was higher than BR-11. Kamruzzaman (2011) studied on economic potential of BRRI Dhan-51 and BR-11 rice production in Rangpur district with a sample of 60 farmers considering Cobb Douglas production function and found that BRRI Dhan-51 had higher gross return than BR-11. The literature showed that a comparison was made between different Aman varieties and it was found that profitability differed in varieties.

Ullah (2008) studied on comparative profitability and technical efficiency of aromatic and non-aromatic Aman rice production in Dinajpur district with a sample of 60 farmers using stochastic frontier analysis and found that profitability of BRRI Dhan-34 (aromatic) was much higher than BR-11 rice (non-aromatic) as the total return from BRRI Dhan-34 was higher than BR-11. The literatures indicated that aromatic rice was economically profitable than fine rice as the gross return of aromatic rice was higher than fine rice.

Hanifa (2009) studied on economic analysis of BR-29 and Hybrid Hira rice production in Netrokona district with a sample of 80 farmers using Cobb-Douglas production function and found that total returns from Hybrid Hira rice per hectare was higher than BR-29.

Sarker*et al.* (2010) conducted a study on comparative economic analysis of credit & non-credit Boro rice farmers in some selected sites of Mymensingh district. They selected one hundred samples from four villages under Trishallupazila. This study has been conducted to examine the differences in input use, costs &returns of the credit & non-credit rice farmers. They were found that credit farmers used more inputs & attained more returns through higher yield than their counterparts. The yields of rice per hector were 5260.80kg & 422177.34kg for the credit and non-credit user farmers respectively. They also found that credit farmer's net return and gross return are higher than non-credit user farmers.

Akter (2011) studied on profitability and resource use efficiency of BRRI Dhan29 in old Brahmaputra floodplain area of Tangail district with a sample of 60 farmers using Cobb-Douglas production function and found that total return of BRRI Dhan29 was higher than total cost. The literature showed that in all cases, Boro rice production was profitable as it produced higher total return than total cost.

Banu (2011) studied on economic analysis of BR-28, BR-29 and Hybrid Hira rice production in Kurigram district with a sample of 90 farmers considering Cobb-Douglas production function and found that Hybrid Hira was more profitable than BR-28 and BR-29 rice as the net return was much higher than BR-28 and BR-29. The literatures show that hybrid Hira rice was more profitable than other Boro rice varieties as it earned higher total return than Boro rice.

Kana (2011) studied on economic analysis of salt tolerant Binadhan-8 and HYV BRRI Dhan28 rice production in Satkhira district with a sample of 60 respondents using Cobb-Douglas production function and found that total return of Binadhan-8 was greater than total return of BR-28.

Khan et al. (2011) studied on resource use efficiency and profitability of Boro rice production in Mymensingh district with a sample of 120 Boro farmers by considering Cobb-Douglas production function and revealed that the main problems were lack of capital, attack of pests, high wage rate, lack of storage facilities, high cost of irrigation, low prices of output, high transportation cost and lack of extension service.

The study showed that lack of capital, high transportation cost, low price of output, lack of storage facilities, high wage of labor were the major problems in Boro rice production.

Kundu (2011) studied on profitability of jute production and value addition activities of HYV Boro rice production in Madaripur district with a sample of 73 jute farmers using Cobb-Douglas production function and found that HYV Boro rice cultivation was profitable and medium farmers had the highest profit. The literature showed that medium farmers had higher net return than small and large farmers.

Siddique (2011) studied on profitability analysis of jute growing farmers in Mymensingh district with a sample of 60 farmers considering Cobb-Douglas production function and found that medium farmers had the highest profit than small and large farmers in accordance to higher gross return than total cost.

Wadud *et al.* (2011) conducted a study on Profit Efficiency and Farm Characteristics Evidence from the Rice Farmers in Bangladesh. They examine profit efficiency of rice farmers in some selected district of Bangladesh. From the study they found that estimated profit frontier revealed negative elasticity of price of fertilizers and positive elasticity of wage rates, price of seeds and area of land cultivated. The mean profit efficiency was 69 percent.

Chowdhury (2012) studied on the economic potential of BR-28 and BR-29 in Rangpur district with a sample of 80 respondents by using Cobb-Douglas production function technique and found that cost of irrigation, seed, human labor and insecticide showed significant impact on BR-28 whereas cost of human labor, seed, irrigation and insecticides showed significant impact on BR- 29.

Chowdhury *et al.* (2013) investigated the Efficiency of Rice Farms during Boro Period in Bangladesh: An Econometric Approach. They were focusing to achieve the target by improving the efficiency of the farmers. Modern econometric tools, like Stochastic Frontier Approach (SFA) were used for measuring the efficiencies of the farmers. Empirical results of this study showed that average technical, allocative and economic efficiency of the farmers during Boro period were 86 per cent, 75 per cent and 64 per cent respectively.

Hoque and Haque (2014) studied on the economic profitability of Boro rice production in Jamalpur, Gazipur and Manikganj district with a sample of 211 respondents by using Cobb-Douglas production function and found that factors like cost of irrigation, insecticide, seed and human labor showed significant effect on profitability.

Mandal (2014) studied on economic analysis, problems and prospects of Boro rice in Tangail district with a sample of 60 jute farmers by considering Cobb-Douglas production function and found that lack of capital, lack of storage facilities, high cost of insecticides, high wage of labor, high cost of transportation and low prices of output were the main problems of Boro rice production.

Rahman and Nargis (2015) studied on economic potential of BRRI Dhan29 with a sample of 60 respondents by using Cobb-Douglas production function technique and found that cost of human labor, power tiller, seed, fertilizer and irrigation showed significant impact on the crop. The literature showed that the most common factors affecting profitability of rice production were cost of irrigation, seed and human labor.

2.2 Research Gap

The above reviews show that different studies were conducted on rice production in Bangladesh where few research were done on impact of agricultural credit on profitability of HYV Boro rice production. However, none of them compared profitability of credit and non-credit users of HYV Boro rice production in Bangladesh. Rice is a staple food in Bangladesh. This crop is highly related with rural economy. It would be very fruitful and interesting to study on a comparative profitability of credit and non-credit users of HYV Boro rice production. Thus, the present study has been undertaken to make an in-depth study to fill the knowledge gap to determine the profitability of credit and non-credit users farmers of Boro rice to help farmers and policymakers in decision making by providing information about agricultural credit on HYV Boro rice production.

CHAPTER - III

METHODOLOGY

CHAPER – III
METHODOLOGY

3.1 Introduction

Farm management research depends on the implementation of appropriate methodology and the accuracy of the primary data. The objectives of the study determine the nature of primary data to be collected. There are various methods of data collection. Survey method was used in this study for collecting primary data for the following reasons.

- Survey method is relatively easy to administer.
- Can be created in less time contrasted with other information gathering techniques.
- Cost-effective, practical and has extensive applicability.
- Equipped for gathering information from a large number of respondents.

This method of data collection has some drawback like the investigator has to rely on the memory of farmers which create some problem. Most farmers are illiterate, and they do not keep any record of information. Repeated visit was made to the study area and to the farmers to obtain the missing information and to reduce the severity of any misinformation. The methodology involved in this study is described below in chronological order.

3.2 Selection of The Study Area

Farm level research requires selection of an area where the research data is collected and the research is done. This research was conducted in Pakundia upazilla of Kishoreganj district considering the researcher familiarity and easy access to the local farmers. Three villages namely Angiadi, Agarshindur, Chartangabor under Pakundia upazila were selected. The farmers were randomly selected for data collection purpose. The main reasons for selecting the area for data collection purpose were-

a. There was not any study done on this research topic in that area.
b. The main crop of the area was HYV Boro rice.
c. The selected villages had similar physical characteristics like- topography, soil and climatic conditions for producing HYV Boro rice.

d. As most of the farmers were involved in HYV Boro rice production, it was expected that reliable data would be successfully obtained from that area. e. Easy accessibility and good communication facilities in the area.

3.3 Sampling Technique and Sample Size

Two factors were considered in selecting samples for a study area. The sample size should be large enough to follow for adequate degrees of freedom in the statistical analysis. Administration of field research, processing and analysis of data should be manageable within the limited resource available. It was impossible to include all the farmers in Pakundia upazilla because they were randomly scattered in a huge area. Money and time were also limited for the study.

Total 60 farmers were selected randomly where 30 farmers were growers of HYV Boro rice by agricultural credit and 30 farmers were growers of HYV Boro rice without agricultural credit by simple random sampling technique.

3.4 Preparation of The Survey Schedule

A draft questionnaire was prepared for collecting data from the sample respondents by keeping the objectives in mind. The questionnaire was pre-tested by interviewing some farmers who cultivated HYV Boro rice. Necessary modifications, additions and alternations were made and then the draft questionnaire was finalized.

The final questionnaire had three categories of information. The first part was prepared to collect socio-economic information. The second part contained information about costs and returns of HYV Boro rice. The third part contained questions related to constraints and problems faced by the farmers in producing HYV Boro rice and getting agricultural credit in the selected area.

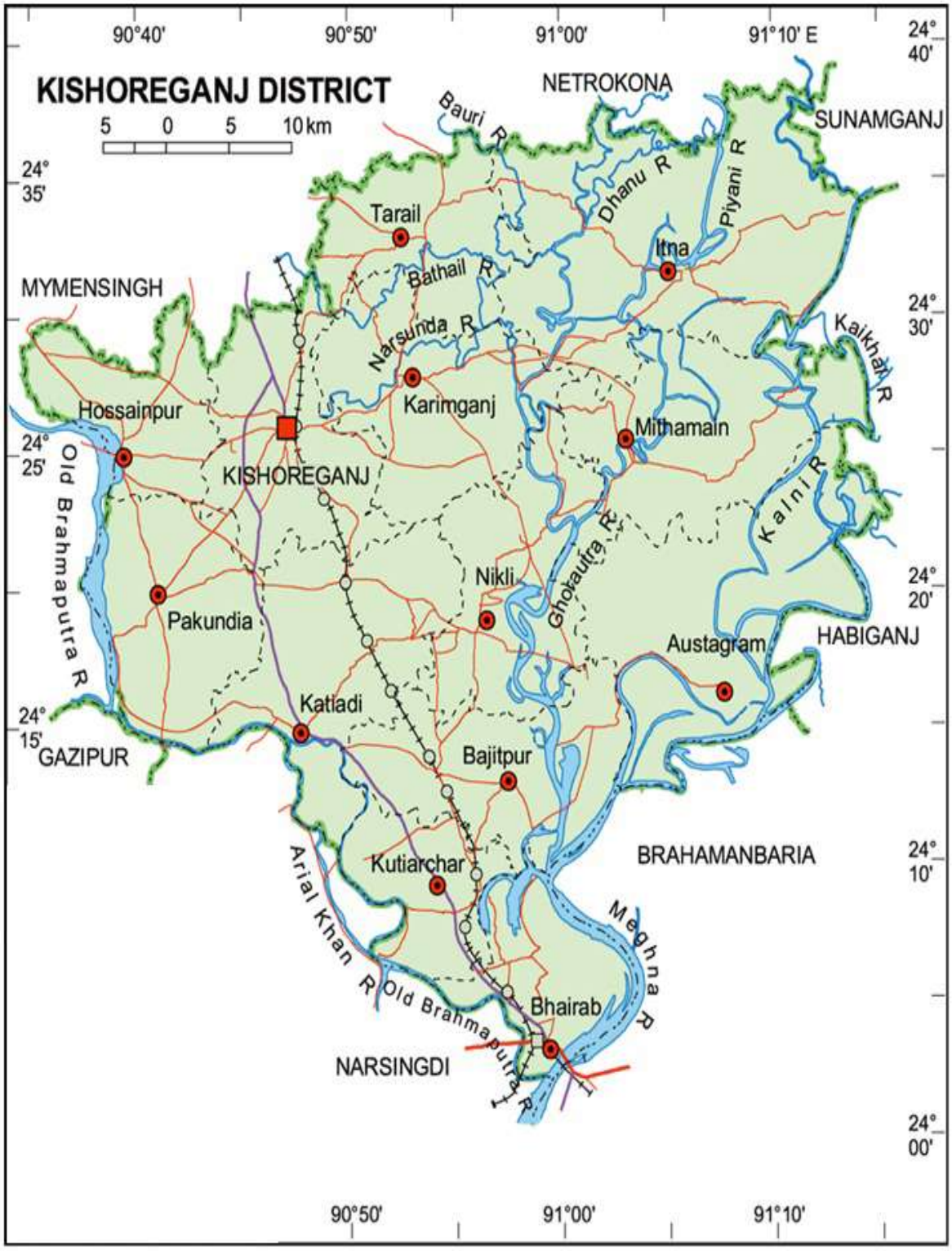


Figure 3.1. A Map of Kishoreganj District Showing Pakundia Upazila

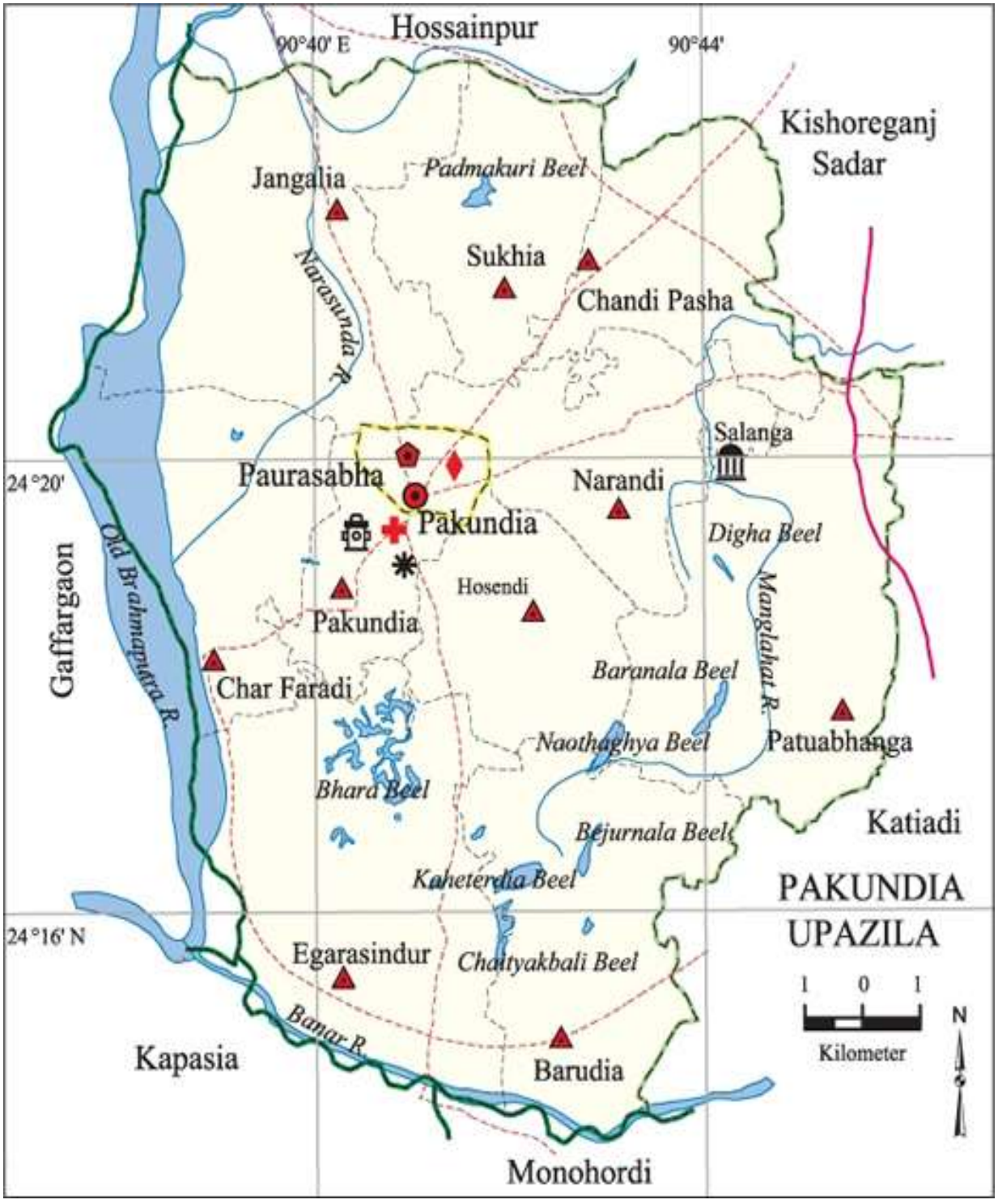


Figure 3.2. A Map of Pakundia Upazila Showing Study Area

3.5 Period of The Study

Data were collected during the period of September to October in 2019 through direct interview with the farmers. Data relating to inputs and outputs were obtained by making time to time visit in the study area.

3.6 Data Collection Method

Required data were collected through field survey by interviewing the HYV Boro rice growers. The relevant information was collected from the HYV Boro rice farmers who were selected. The selected farmers were contacted first so that they could be interviewed according to their convenient time. During interview, the researcher systematically asked questions and explained the purpose of the study for better understanding. The interviewer told the farmers the study was properly academic. When interview was over, the interview schedule was rechecked to ensure that each of the required information was collected properly.

3.7 Processing, Tabulation and Analysis of Data

The collected data were coded and edited manually. After that, all the collected data were scrutinized and summarized very carefully. Data entry was done in computer and analysis was done accordingly in computer. The information was first collected in local units and then it was converted into international standard units.

3.8 Analytical Technique

Several analytical techniques were used to meet particular research objectives. The collected data was analyzed using Microsoft Excel and SPSS because they are very popular and widely used. Eventually, econometric technique such as Cobb-Douglas production function was used to examine the effects of the independent variables on the dependent variables in the production function of HYV Boro rice. Thus, analysis of data was categorized in two parts -

a. Descriptive statistics
b. Cobb-Douglas production function

3.8.1 Descriptive Statistics

The descriptive statistics is a tool that was used through Microsoft Excel software for the sum, average and percentage of total costs, gross returns, net returns and profitability of HYV Boro rice growing farmers. It was also used for analyzing the socio-economic conditions and problems faced by the HYV Boro rice growers.

3.8.2 Cobb-Douglas Production Function

Cobb-Douglas production function that was used to estimate the effects of major factors in the returns of HYV Boro rice production was as follows:

$Y= aX1^{b1}X2^{b2}X3^{b3}X4^{b4}X5^{b5}X6^{b6}X7^{b7}e^{ui}$

The function was transformed into the following log linear form

lnY= ln a +b1 ln X1+ b2 ln X2+ b3 ln X3+ b4 ln X4+ b5 ln X5+ b6 ln X6+ b7 ln X7+ ui

Where,

Dependent variable, Y = Gross Return (Tk/Ha)

Independent variables, X_1 = Human Labor Cost (Tk/Ha)

X_2 = Animal and Mechanical Power Cost (Tk/Ha)

X_3 =Seed/ Seedling Cost (Tk/Ha)

X_4 = Fertilizer Cost (Tk/Ha)

X_5 = Pesticide/Insecticide Cost (Tk/Ha)

X_6 = Manure Cost (Tk/Ha)

X_7 = Irrigation cost (Tk/Ha)

a = constant or intercept term

b1 to b7 = production coefficients of respective input variable to be estimated

ui = Error term

ln = Natural logarithm

3.8.3 Elasticity of Production (Ep)

The elasticity of production is defined as the percentage change in output with the change of percentage in input, if other factors remain constant. The Cobb-Douglas production function is very useful in calculating the elasticity of production. The elasticity of production can be conveyed as-

Elasticity of production, Ep = bi

If Ep = 1, Production elasticity is unity

Ep> 1, Production is elastic, and

Ep<1, Production is inelastic.

3.8.4 Return to Scale (RTS)

The return to scale can be obtained by summing up the regression coefficients of all explanatory variables in Cobb-Douglas production function. This can be conveyed as-

Return to scale, RTS= $\sum$bi

Where, n= number of regressions, and bi= regression coefficients.

If, RTS=1 then it is constant return to scale

RTS>1 then it is increasing return to scale

RTS<1 then it is decreasing return to scale.

3.9 Limitations of The Study

This present study was conducted regarding HYV Boro rice production and the data was collected in rural areas. There were some problems during data collection. Some of the problems were-

a. Researcher had to conduct this study in a limited time period which was not enough to conduct an in-depth study.
b. Researcher also did not have any funding for this research. For this reason, it was not possible to cover big area.
c. During the interview, the researcher found it difficult to avoid the interruption of others as interviews took place in farmer's field or in their houses.

3.10 Ethical Issues

Researcher tried to follow all the ethical issues related to the study. Researcher booked an appointment before interviews of the farmers and farmers were well informed about the purpose of the study. Additionally, farmers were ensured that their information would be used only for the completion of thesis paper and would not be used for other purposes. The collected data were preserved in a password protected device

CHAPTER- IV

SOCIO-ECONOMIC CHARACTERISTICS OF BORO RICE FARMERS

CHAPTER – IV
SOCIO-ECONOMIC CHARACTERISTICS OF BORO RICE FARMERS

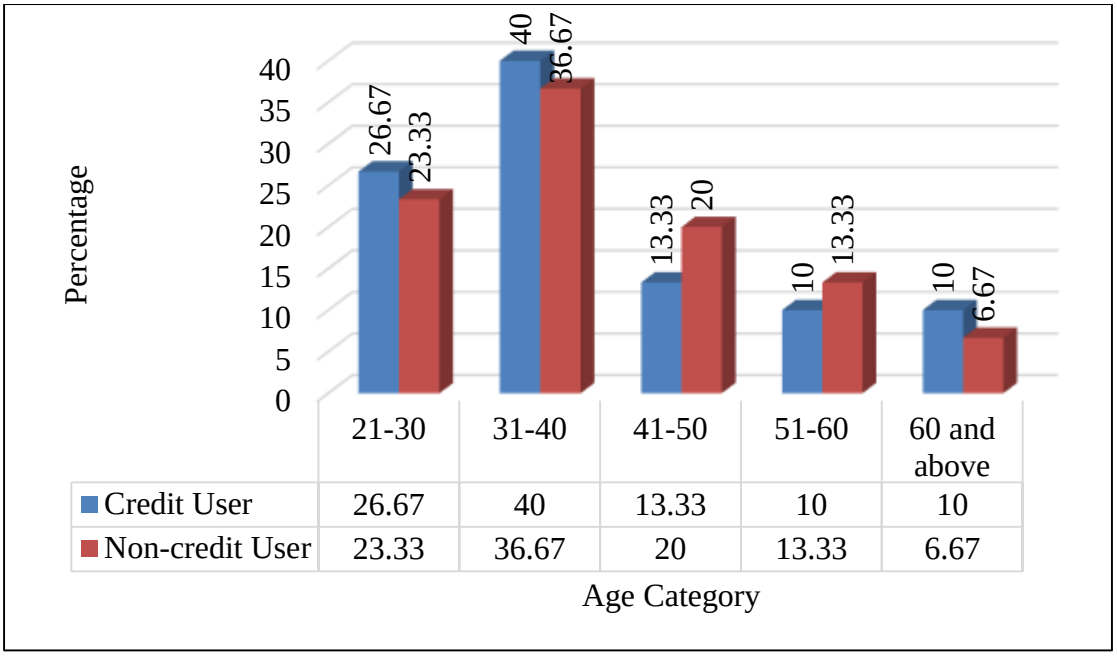
4.1 Socio-Economic Characteristics of Credit and Non-Credit Users of High Yield Variety Boro Rice Farmers

The socio-economic characteristics of the sample farmer are an essential part of research because these characteristics can affect their production decision and production pattern. There was a lot of difference in the socio-economic characteristics of credit and non-credit users in the selected areas. The socio-economic characteristics of the sample farmers that was considered in the study area involved farmers age, family size and composition, education status, marital status, occupation level, farming experience and farm holdings of the farmer.

4.1.1 Age Structure of the Sample Farmers

The respondents of credit and non-credit users were classified into five categories such as 21-30 years, 31-40 years, 41-50 years, 51-60 years, 61 years and above. Figure 4.1 shows that out of total credit user 26.67 percent fall into 21-30 years, 40 percent were between 31-40 years, 13.33 percent fall into 41-50 years, 10 percent fall into 51-60 years and 10 percent farmers belong to between 61 years and above age group.

Figure 4.1 also shows that out of total non-credit user 23.33 percent fall into 21-30 years, 36.67 percent were between 31-40 years, 20 percent fall into 41-50 years, 13.33 percent fall into 51-60 years and 6.67 percent farmers belong to between 61 years and above age group. It was obvious from Figure 4.1 that majority of credit user fell into 31-40 years age group which was 40 percent whereas majority of non-credit were between 31-40 years age group which was 36.67 percent.



(Source: Field survey, 2019)

Figure 4.1 Distribution of Sample Farmers According to Age Group

4.1.2 Gender

In the study area most male members worked in the field and most female members worked inside home. It was rare to see any female farmers in the study area. Table 4.1 shows that 100 percent farmers both of credit and non-credit user of Boro rice growers are male among the sample respondent.

Table 4.1 Gender of Boro Rice Farmers

Gender	Credit user		Non-credit user	
	No of farmer	Percent (%)	No of farmer	Percent (%)
Male	30	100	30	100
Female	0	0	0	0
Total	30	100	30	100

(Source: Field survey, 2019)

4.1.3 Marital status

Marital status of the respondent is a significant factor that affects the lifestyle and economic activities of a family. Farmers were coded as Married = 1, Unmarried = 2 and Widow/widower = 3 for analysis purpose. Table 4.2 shows that 93.33 percent credit user were married and 6.67 percent fall into widow/ widower category in the study area. Table 4.2 also shows that 96.67 percent non-credit users were married and 3.33 percent are unmarried category in the study area. It was obvious from Table 4.2 that non-credit users were married more in number than credit user.

Table 4.2 Marital Status of the Respondents

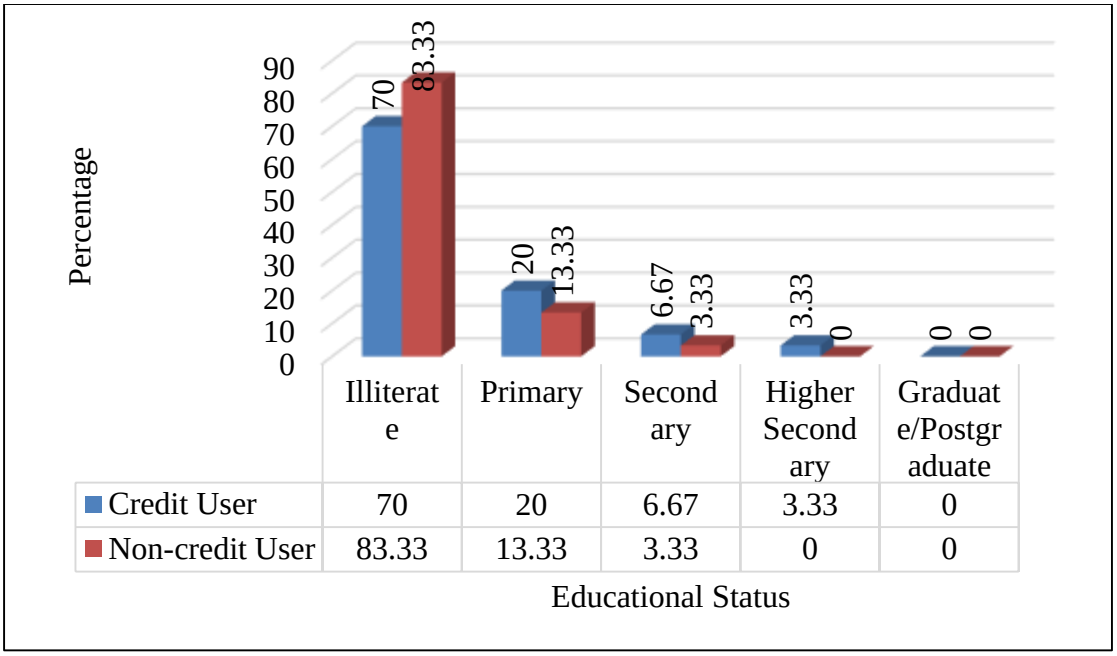
Marital status	Credit user		Non-credit user	
	No of farmer	Percent (%)	No of farmer	Percent (%)
Married	28	93.33	29	96.67
Unmarried	0	0	1	3.33
Widow/widower	2	6.67	0	0
Total	30	100	30	100

(Source: Field survey, 2019)

4.1.4 Educational Status of the Respondents

Education helps individuals to develop the capacity of understanding their environment and improve rational insight of life. Education influences farmers to adopt the modern technology and use scarce resources efficiently which contribute to earning higher profit. The farmers were classified into four categories such as illiterate, primary, secondary, higher secondary and graduate/postgraduate for research purpose. Literacy of farmers were coded for analyzing purpose as Illiterate = 1, primary = 2, Secondary = 3, Higher secondary = 4, Graduate/postgraduate = 5. Figure 4.2 shows that among credit user farmers 70 percent are illiterate, 20 percent have primary education, 6.67 percent have secondary education and 3.33 percent have higher secondary education but no farmers have graduate or post graduate degree. Figure 4.2 also shows that among non-credit user 83.33 percent are illiterate, 13.33 percent have primary education and

3.33 percent have secondary education but no farmer has higher secondary, graduate/ post graduate degree. It was obvious from Figure 4.2 that majority of farmers both of credit user and non-credit user was illiterate which was 70 percent in credit user and 83.33 percent in non-credit user. This figure revealed that non-credit user farmers were more illiterate in number than credit user farmers.



(Source: Field survey, 2019)

Figure 4.2 Educational Status of the Respondents

4.1.5 Family Size and Composition

Family is an important social institution which creates a strong social bond between family members. Family size plays crucial role in the social and economic life of farmers. In this study, family size has been defined as the total number of people living together under the administration of the head of the family. Family size includes farmer himself, children, wife, father, mother, sisters and brothers. A large family has more labor to earn through different activities but it requires higher costs to fulfill the daily needs of the family members. Table 4.3 shows that out of total credit user 36.67 percent families consist of 1-5 members, 50 percent have 6-8 members and 13.33 percent have above 8 family members.

Table 4.3 also reveals that out of total non-credit user 30 percent families consist of 1-5 members, 63.33 percent have 6-8 members and 6.67 percent have above 8 family

members. It was obvious from Table 4.3 that most of credit user and non-credit user had 6-8 members.

Table 4.3 Distribution of The Farmers by Family Size

No of family member	Credit user		No credit user	
	No of farmer	Percent (%)	No of farmer	Percent (%)
1-5	11	36.67	9	30
6-8	15	50	19	63.33
Above 8	4	13.33	2	6.67
Total	30	100	30	100

(Source: Field survey, 2019)

Table 4.4 shows that out of total 222 family members of credit user 126 were male and 96 were female. The male female ratio was 1.31 in credit user farmer (Table 4.4). Table 4.4 also shows that out of total 205 family members of non-credit user farmers, 122 were male and 93 were female. The male-female ratio was 1.20 in non-credit user farmer families (Table 4.4). It was obvious from Table 4.4 that credit user farmers (52.94 percent) had more male members than non-credit farmers (47.06 percent).

Table 4.4 Male-Female Ratio of Sample Farmers Family

Categories	Male		Female		Male-female ratio	Total
	No of farmer	Percent (%)	No of farmer	Percent (%)		
Credit user	126	52.94	96	50.79	1.31	222
Non- credit user	112	47.06	93	49.21	1.20	205
Total	238	100	189	100	1.25	427

(Source: Field survey, 2019)

4.1.6 Occupational Structure

In the study area, farmers were engaged in various types of occupation like crop cultivation, private service, public job, small business, poultry and livestock rearing and fish culture. Farmers were classified for research purpose into five groups such as agriculture, business, service, wage labor, van/rickshaw pulling as almost all farmers

were involved in at least one of these categories. The agriculture category consists of crop cultivation, fish culture, fishing, poultry and livestock rearing. The occupation of respondents was also classified into two broad groups such as main and subsidiary. Farmers were coded as agriculture = 1, business = 2, service = 3, Wage labor = 4, Rickshaw/van pulling = 5. Table 4.5 shows that 76.67 percent of credit users were involved in agriculture, 16.67 percent into business and 76.67 percent into service as their main occupation. Table 4.5 also reveals that 90 percent of non-credit users were involved in agriculture, 3.33 percent into business and 6.67 percent in rickshaw pulling as their main occupation. It was obvious from Table 4.5 that the main occupation of the respondents both of credit user and non- credit user farmers was agriculture as 83.33 percent were involved in agriculture.

Table 4.5 Occupational Status of the Sample Farmers

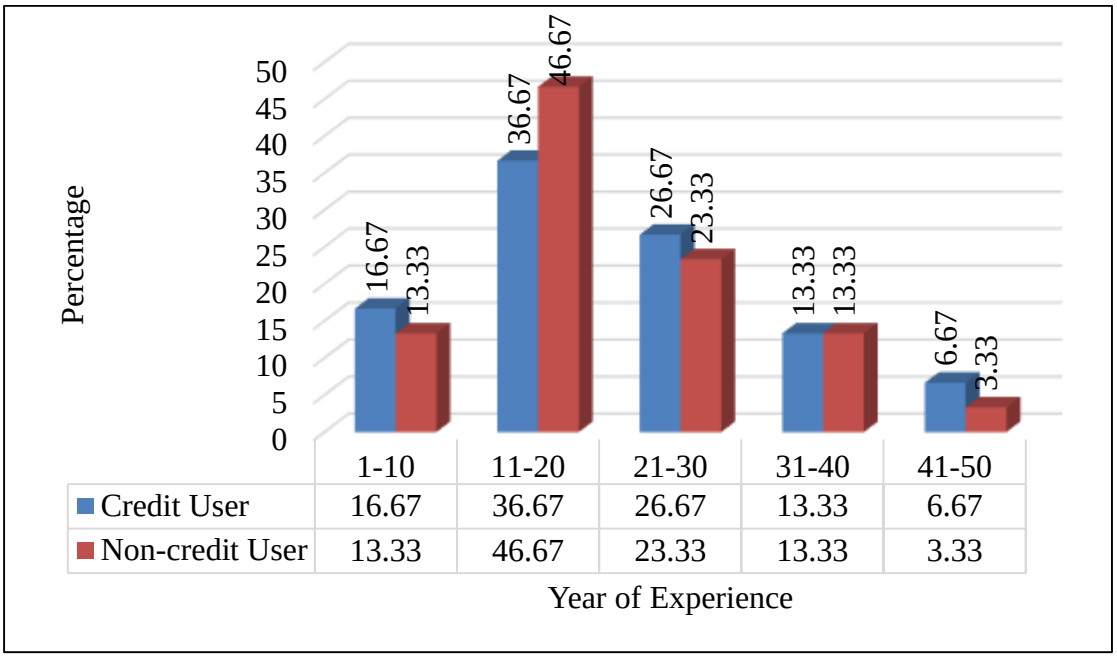
Occupation	Credit user		Non-credit user		All groups	
	Main	Subsidiary	Main	Subsidiary	Main	Subsidiary
Agriculture	23 (76.67%)	3	27 (90 %)	3	50 (83.33%)	6
Business	5 (16.67%)	8	1 (3.33%)	0	6 (10 %)	8
Service	2 (6.67%)	0	0	0	2 (3.33%)	0
Wage labor	0	0	0	0	0	0
Van/Rickshaw Pulling	0	0	2 (6.67%)	1	2 (3.33%)	1
Total	30	11	30	4	60	15

(Source: Field survey, 2019)

4.1.7 Farming Experience

Experience is a vital tool for operating agricultural activities. An experienced farmer knows how to till land correctly, spray pesticide and optimum doses of fertilizers than an inexperienced farmer. The farmers in the study area were divided into five groups based on their year of farming experience. Figure 4.3 shows that out of total credit user 16.67 percent farmers have 1-10 years, 36.67 percent have 11-20 years, 26.67 percent

have 21-30 years, 13.33 percent have 31-40 years and 6.67 percent have 41-50 years of experience. Figure 4.3 also reveals that out of total non-credit user farmer 13.33 percent farmers have 1-10 years, 46.67 percent have 11-20 years, 23.33 percent have 21-30 years, 13.33 percent have 31-40 years and 3.33 percent have 41-50 years' experience. From Figure 4.3, it was obvious that most of the respondents both of credit and non-credit farmers had 11-20 years of experience who were related with agricultural activities.



(Source: Field survey, 2019)

Figure 4.3 Distribution of Sample Farmers According to Farming Experience

4.1.8 Farm Holdings of the Respondents

Farm holding is the entire land owned by the farmers and is used by the farmers for any agricultural purpose. Farmers were classified into three categories- small (0.5-1 ha), medium (1.00-2.00 ha) and large farmers (>2.00 ha) based on the farm holding size. Farmers were coded as small farmer = 1, Medium farmer = 2, Large farmer = 3. It was found from Table 4.6 that out of total credit user farmers, 70 percent were small farmers, 23.33 percent were medium and 6.67 percent were large farmers.

Table 4.6 also shows that out of total non-credit farmers 80 percent were small, 16.67 percent were medium and 3.33 percent were large farmers in the study area. Based on Table 4.6, it was obvious that farmer of non-credit user with small farm size was higher in percentage than credit user farmer.

Table: 4.6 Classification of the respondents according to farm holding size

Land holding	Farm size (ha)	Credit user		Non-credit user	
		No of farmer	Percent (percent)	No of farmer	Percent (percent)
Small farmers	0.5-1.00	21	70	24	80
Medium farmers	1.00-2.00	7	23.33	5	16.67
Large farmers	2.00- above	2	6.67	1	3.33
Total		30	100	30	100

(Source: Field survey, 2019)

CHAPTER – V

PROFITABILITY ANALYSIS AND FACTORS AFFECTING OF BORO RICE PRODUCTION

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PROFITABILITY ANALYSIS AND FACTORS AFFECTING OF BORO RICE PRODUCTION

5.1 Profitability Analysis of Boro Rice Production

The costs return and profitability of producing Boro rice briefly described in this chapter. The variable and fixed costs were considered to estimate the total cost of production of Boro rice. Variable costs include cost of human labour, power tiller, animal labour, mechanical labour, seed, fertilizer, manure, pesticide, irrigation cost of credit and Interest on operating capital. Fixed costs include land use cost. The total return includes return from main product and by product.

5.1.1 Estimation of Variable Costs

Variable costs include the costs of using all variable inputs. There are some costs that vary with the level of production such as cost of seed, fertilizer, human labour, manure, irrigation, power tiller and insecticide. These inputs are essential in production. Thus, the costs must be estimated for calculating the total production costs. Variable costs for Boro rice production are discussed below.

Cost of Human Labour

The rate of a man-day was varied from Tk. 300 to Tk. 350 during the cropping period. It was higher in the period of harvest (average Tk. 500) and lowest in the period of weeding (average Tk. 325). The total cost of human labour was, therefore, Tk. 43989.00 per hectare for credit rice farms (Table 5.1).

Tabel 5.1: Human Labor cost credit user

Operation	Labor (man-days)		Total labor (man-days)	Unit Cost (Tk.)	Total Cost (Tk.)	% of total labor cost
	Family Labor	Hired Labor				
Land preparation	3.5	13.13	16.63	350	5821	13.23
Transplanting	4.5	16.88	21.38	350	7483	17.01
Weeding	3.4	20.01	23.41	325	7608	17.30
Fertilizer and Insecticide	3.8	1.2	5	340	1700	3.86
Harvesting	5.8	17.95	23.75	450	10687.45	24.30
Threshing	7.2	14.18	21.38	500	10689.46	24.30
Total	28.2	83.69	111.89		43988.91	100

(Source: Field survey, 2019)

The total cost of human labour was, therefore, Tk. 40589.00 per hectare for non-credit rice farms (Table 5.2).

Table 5.2: Human Labor cost for non-credit user

Operation	Labor (man-days)		Total labor (man-days)	Unit Cost (Tk.)	Total Cost (Tk.)	% of total labor cost
	Family Labor	Hired Labor				
Land preparation	4.5	11.95	16.45	350	5757.50	14.18
Transplanting	4.2	15.35	19.55	350	6842.50	16.86
Weeding	5.4	12.44	17.84	325	5798.00	14.28
Fertilizer and Insecticide	3.8	1.2	5	340	1700.00	4.19
Harvesting	5.8	15.98	21.78	450	9801.00	24.15
Threshing	7.2	14.18	21.38	500	10690.08	26.34
Total	28.2	83.69	111.89		40589.00	100

(Source: Field survey, 2019)

Cost of Seed/Seedlings

For any agricultural crop production seed is the basic input. Yield of any agricultural production is highly dependent on the quality of seed. High quality of seed can yield high production and bad quality can produce low rate of production. Table 5.3 shows that farmers of Boro rice 42.26 kg seed per hectare. Per unit cost of seed for credit and non-credit users of Boro rice was Tk. 70 and Tk. 68 respectively during data collection. Total cost of seed for credit and non-credit users of Boro rice was estimated as Tk. 3027.91 and 2862.05 Tk. per hectare in which seed cost of credit users of Boro rice was 7.23 percent and seed cost of non-credit users of Boro rice was 7.48 percent of total material input costs.

Table 5.3. Per Hectare Cost of Material Inputs for Boro Rice Production

Various Inputs	Units	Quantity	Credit user			Non-credit user		
			Unit price (Tk.)	Total Cost (Tk.)	percent of total Cost	Unit price (Tk.)	Total Cost (Tk.)	percent of total Cost
Seed	Kg	42.26	70	3027.91	7.23	68	2862.05	7.48
Fertilizer	Kg							
Urea	Kg	223	18	4014		18	4014	
TSP	Kg	174	30	5220		30	5220	
MOP	Kg	124.3	15	1988.8		15	1988.8	
Total fertilizer cost	Tk.			11222.8	26.79		11222.8	29.35
Manure	Kg	475.44	6	2875.1	6.86	1	475.44	1.24
Insecticides	Tk.			1872.27	4.47		1643.27	4.30
Animal and Mechanical power	Tk.			7683.3	18.34		7825.07	20.46
Irrigation	Tk.			15211.6	36.31		14211.3	37.16
Total				41893	100.00		38239.9	100.00

(Source: Field survey, 2019)

Cost of Fertilizer

Farmers of credit and non-credit user of Boro rice used fertilizers such as Urea, TSP and MOP which were required for cultivation. Table 5.3 shows that per hectare total fertilizer cost of Boro rice is estimated as Tk. 11222.8 and it is 26.79 percent of the total material input cost and Tk 11222.8 and it is 29.35 percent for credit users and non-credit users respectively.

Cost of Manure

Most farmers in the study area had their own cow and for this reason they did not have to buy manures for using in the field. The farmers were able to use manures from their own supply. Table 5.3 shows that per hectare cost of manure for Boro rice production is Tk. 2875.1 which is 6.86 percent of total material input cost and Tk.475.44 which is 1.24 percent of total material cost for credit users and non-credit user respectively.

Cost of Animal and Mechanical Power

Animal labour was used for mainly land preparation of Boro rice production. The cost of pair of bullocks was considered as animal labour. Table 5.3 shows that total animal and mechanical power cost for Boro rice production is Tk. 7683.3 per hectare which is 18.34 percent for credit and non-credit users Tk. 7825.07 per hectare which is 20.46 percent of total material input cost.

Cost of Irrigation

In the study area, all the sample farmers had to depend on Deep tube-well (DTW) and shallow tube-well (STW) for irrigation. Most of the farmers used purchased water for irrigation. The average irrigation costs were Tk. 15211.6 and Tk. 14211.3, per hectare for credit and non-credit user of rice farmers, respectively. Credit user farmers irrigated more than non-credit user rice farmers. In the case of credit rice farmers, 36.31 percent and 37.16 percent of the total cash cost of the irrigation cost was borne by SF and CF fund, respectively (Table 5.3). Cost of irrigation was 11.52 percent of the total cost for the credit user farmers and 11.40 percent of the total cost for the non-credit user of rice farmers in the study area (Table 5.4).

Cost of Insecticide

There are several types of insects that can cause damage in the yield of Boro rice production. Termites, caterpillars, beetles, horned grasshoppers, rats, brown plant hopper, yellow stem borer, gal midge, leaf folder and rice bug cause serious damage in Boro rice. Farmers had to use insecticides to control pests in the study area. Table 5.3 shows that the estimated cost per hectare for Boro rice is Tk. 1872.27 for credit users which is 4.47 percent of total material input cost and Tk. 1643.27 for non-credit users which is 4.30 percent of total material input cost.

5.1.2 Estimation of Fixed Costs

Fixed costs are those expenses that are not dependent on the level of output and does not change with an increase or decrease with the level of output change. The producers must bear the expense even if the production is not undertaken. Fixed costs include land use cost and interest on operating capital which is described below.

Land Use Cost

Most of the farmers in the study area had own land for producing Boro rice. Land use cost was a fixed cost for the producers. Table 5.4 shows that the land use cost per hectare is estimated at Tk. 44820.76 which is similar for Boro rice production. The land use cost of Boro rice was Tk 44820.76 which is 33.96 percent and 35.98 percent of total production cost of credit and non-credit user farmer respectively.

Interest on Operating Capital (IOC)

Interest on operating capital was calculated for 4 months for Boro rice. Interest rate 9 percent per annum was considered for calculation. Interest on operating capital was calculated based on this formula-

Interest on Operating Capital (IOC) = AI*i*t

Where,

AI = (Total investment)/2

i = Rate of interest

t = Length of crop period in months

Table 5.4 shows that interest on operating capital calculated for Boro rice is Tk. 1288.23 for credit and non-credit users is Tk. 1178.66 per hectare. IOC of Boro rice was 0.98

percent and 0.95 percent of total production cost respectively credit and non-credit users.

Table 5.4. Per Hectare Total Cost of Boro Rice Production

Cost items	Credit user farmer			Non-credit farmer
	Self-financing (SF)	Credit financing (CF)	Total	
Human labour:	A. Variable cost			
Own	15367.9	-	15367.87	14156.21
Hired	11245.6	17375.5	28621.04	26432.87
Total	26613.4	17375.5	43988.91(33.33)	40589.08(32.58)
Seed:				
Own	640.32	-	640.32	580.47
Hired	2387.59	-	2387.59	2281.58
Total	3027.91	-	3027.91(2.29)	2862.05(2.30)
Fertilizer & manure:				
Own	2165.19	-	2165.19	1691.82
Hired	5678.37	6254.31	11932.68	9754.62
Total	7843.56	6254.31	14097.87(10.68)	11446.44(9.19)
Insecticides:	243.29	1628.98	1872.27(1.42)	1643.27(1.32)
Animal & mech. power:				
Own	783.66	-	783.66	581.44
Hired	2275.48	4624.16	6899.64	7243.63
Total	3059.14	4624.16	7683.3(5.82)	7825.07(6.28)
Irrigation	6243.76	8967.82	15211.58(11.52)	14211.28(11.40)
Interest on Operating Capital @ of 9 percent for 4 months			1288.23(0.98)	1178.66(0.95)
Total variable Cost	47031.1	38850.8	87170.07(66.04)	79755.85(64.02)
B. Fixed cost				
Land use cost	-	-	44820.76(33.96)	44820.76(35.98)
Total fixed cost	-	-	44820.76(33.96)	44820.76(35.98)
Total costs(A+B)	-	-	131990.83	124576.61

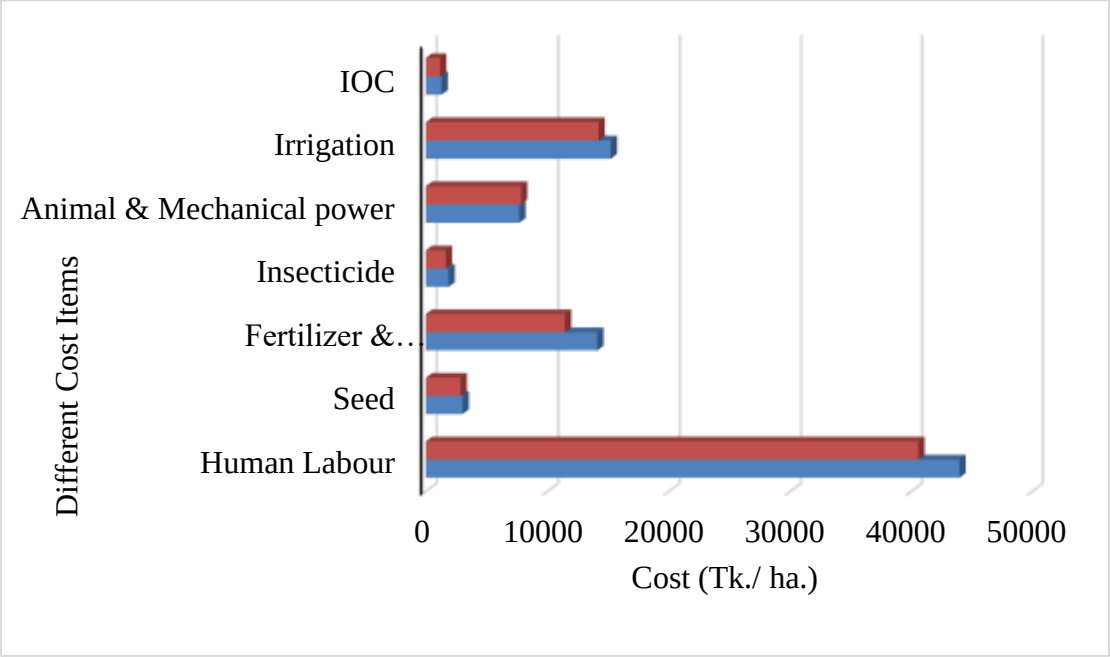
(Source: Field survey, 2019)

Note: Figures in the parenthesis are showing the percentages

5.1.3 Total Cost

The total cost was estimated by summing up the variable and fixed cost for Boro rice production. Table 5.4 shows that total variable cost for Boro rice is Tk. 87170.07 that is 66.04 percent of total cost and Tk. 79755.85 that is 64.02 percent of total cost credit and non-credit user of farmers respectively.

Table 5.4 also shows that total fixed cost for Boro rice was Tk. 44820.76 which is 33.96 percent and Tk. 44820.76 which is 35.98 percent credit and non-credit user of farmer respectively. The total cost per hectare estimated for Boro rice production was Tk. 131990.8 and Tk. 124576.61 for credit and non-credit users respectively (Table 5.4).



(Source: Field survey, 2019)

Figure 5.1: Per Hectare Costs of Various Inputs of Boro Rice Production for Credit User and Non-Credit User Farmers

5.1.4 Profitability of Rice Production

Per hectare rice produced in credit and non-credit users farm were 10697.04 kg and 8985.64 kg. These also produced 4116.67 kg and 3812.84 kg straw, which valued at Tk. 10991.51 and Tk. 10180.28 respectively. The gross returns of credit and non-credit user rice farmers were estimated Tk. 230280.83 and Tk. 194385.90 per hectare,

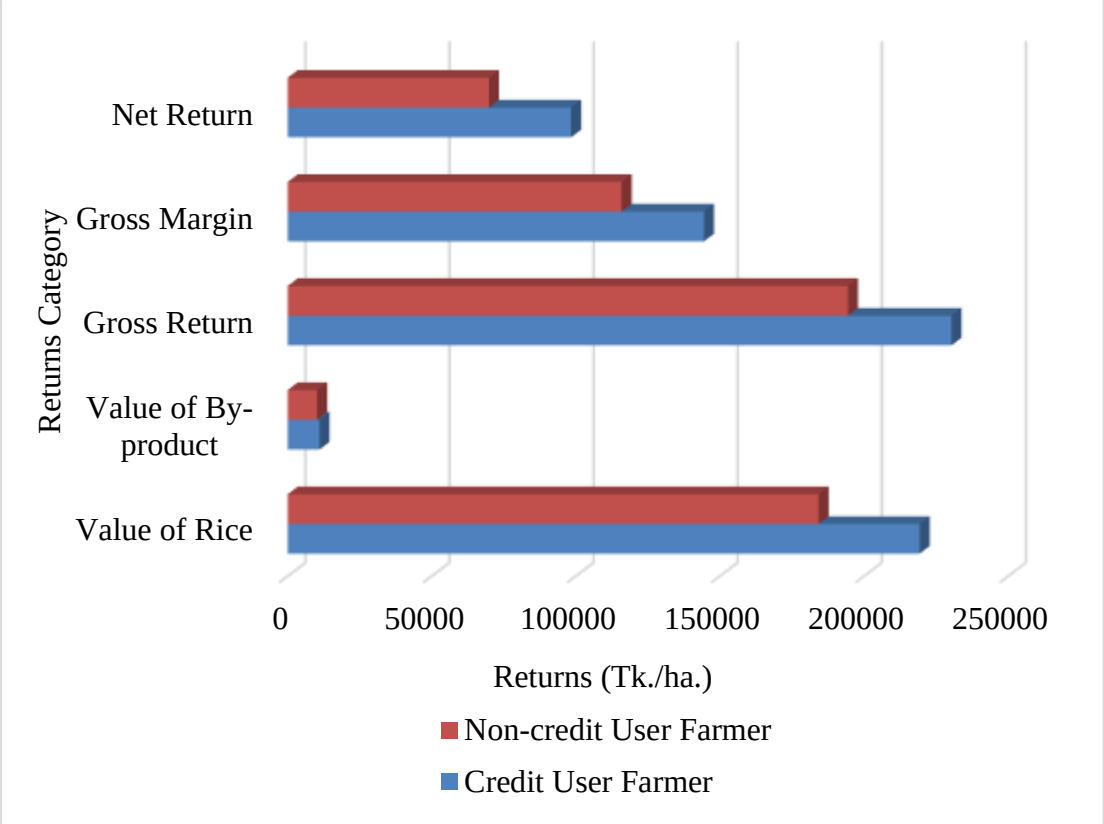
respectively (Table 5.5). The average market prices of rice and by-product were Tk. 11.75 and Tk. 2.67 per kg respectively.

Table 5.5. Summary Results of Costs and Returns of the Credit and Non-Credit Users of Boro Rice Farmers

Particulars	Amount (Tk./ha)	
	Credit users	Non-credit users
Yield of rice (kg/Ha)	10697.04	8985.64
Yield of by-product (kg/Ha)	4116.67	3812.84
Value of rice	219289.32	184205.62
Value of by-product	10991.51	10180.28
Gross return	230280.83	194385.90
Variable cost	87170.07	79755.85
Fixed cost	44820.76	44820.76
Gross cost	131990.83	124576.61
Net return	98290.00	69809.29
Gross margin	144398.99	115808.71
BCR	1.74	1.56

(Source: Field survey, 2019)

The total costs of rice were estimated Tk. 131990.83 and Tk. 124576.61 for the credit and non-credit farmers, respectively (Table 5.5). Per hectare net returns of credit and non-credit user rice farmers were calculated at Tk. 98290.00 and Tk. 69809.29 (Table 5.5).



(Source: Field survey, 2019)

Figure 5.2. Per Hectare Gross and Net Returns from Boro Rice Production of Credit User and Non-Credit User Farmers

Undiscounted BCRs, for sample farmers were found to be 2.68 and 2.47 on variable cost basis in case of credit and non-credit user rice farmers respectively (Table 5.5). Again, in case of credit and non-credit user rice farmers, the undiscounted BCRs were 1.74 and 1.56 on total cost basis (Table 5.5).

5.2 Factors Affecting the Profitability of Boro Rice Production

Cobb-Douglas production function model was chosen to determine the effects of different inputs on the profitability of Boro rice production because of its best fit. The significant effects of using various inputs on returns from Boro rice cultivation can be estimated by analysing the production function of those crops. This model enables to analyse the production function easily. Seven independent variables such as human labour cost, animal & mechanical power cost, seed cost, fertilizer cost, manure cost, irrigation cost and insecticide cost were taken into consideration as they were likely to have an impact on gross return of Boro rice production.

Other variables such as rainfall, soil condition and topography were not considered as there were problems of specification of those variables.

5.2.1 Estimation of Boro Rice Production Function

Cobb-Douglas production function model was chosen to determine the effects of different inputs on the production of Boro rice because of its best fit and significant effects of using various inputs on returns from Boro rice. The estimated values of co-efficient and related statistics were shown in Table 5.6.

Interpretation of The Results

Seven variables such as human labour cost, animal & mechanical power cost, seed cost, fertilizer cost, pesticide cost, manure cost and irrigation cost were taken under consideration. The impact of each variable on gross return for producing Boro rice are interpreted below.

Human Labour Cost (X_1)

Table 5.6 shows that the regression coefficient of human labor cost for credit user Boro rice farmer is -0.045 which is negative and significant at 5 percent level. It indicates that considering all other factors constant, 1 percent increase in the cost of human labor would decrease gross return by 0.045 percent Table 5.6 also shows that the regression coefficient of human labor cost for non-credit user farmer is -0.021 which is negative and significant at 5 percent level. It indicates that considering all other factors constant, 1 percent increase in the cost of human labor would decrease gross return by 0.021 percent

Animal and Mechanical Power Cost (X_2)

Table 5.6 shows that the regression coefficient of power tiller cost for credit user Boro rice farmer is 0.035 which is positive and significant at 5 percent level. It indicates that considering all other factors constant, 1 percent increase in the cost of power tiller would increase gross return by 0.035 percent.

Table 5.6 also shows that the regression coefficient of power tiller cost for non-credit user farmer is -0.016 which is negative and significant at 1 percent level. It indicates that considering all other factors constant, 1 percent increase in the cost of power tiller would decrease gross return by 0.016 percent

Seed Cost (X_3)

Table 5.6 shows that the regression coefficient of seed cost for credit user Boro rice farmer is 0.019 which is positive and significant at 1 percent level. It indicates that considering all other factors constant, 1 percent increase in the cost of seed would increase gross return by 0.019 percent Table 5.6 also shows that the regression coefficient of seed cost for non-credit user farmer is 0.013 which is positive and significant at 1 percent level. It indicates that considering all other factors constant, 1 percent increase in the cost of seed would increase gross return by 0.013 percent.

Table 5.6. Estimated values of coefficients of Cobb-Douglas production function.

Explanatory variables	Credit user farmers		Non-credit user farmers	
	Estimated values	t-values	Estimated values	t-values
Intercept	9.84	6.27	9.26	5.96
Human Labour (X_1)	-0.045**	1.015	-0.021**	1.224
Animal and Mechanical Power Cost (X_2)	0.035**	1.552	-0.016***	3.465
Seed Cost (X_3)	0.019***	2.575	0.013***	2.764
Fertilizer Cost (X_4)	0.054**	2.577	0.044**	1.814
Insecticide/Pesticide Cost (X_5)	0.385	1.255	0.172	1.483
Manure Cost (X_6)	0.312	3.872	0.163	1.567
Irrigation Cost (X_7)	-0.041**	0.805	0.286	1.023
R^2	0.797		0.784	
Adjusted R^2	0.724		0.745	
F-Ratio	20.35***		19.76**	

(Source: Field survey, 2019)
Note: *** and ** indicate significant at 1% level and 5% level.

Fertilizer Cost (X_4)

Table 5.6 shows that the regression coefficient of fertilizer cost for credit user Boro rice farmer is 0.054 which is positive and significant at 5 percent level. It indicates that considering all other factors constant, 1 percent increase in the cost of fertilizer would increase gross return by 0.054 percent Table 5.6 also shows that the regression coefficient of fertilizer cost for non-credit user farmer is 0.044 which is positive and significant at 5 percent level. It indicates that considering all other factors constant, 1 percent increase in the cost of fertilizer would increase gross return by 0.044 percent.

Insecticide/Pesticide Cost (X_5)

Table 5.6 shows that the regression coefficient of pesticide cost for both credit and non-credit user of Boro rice are 0.385 and .172 respectively which are positive but insignificant. This indicates that pesticide cost had no significant effect on the gross return of credit and non-credit user Boro rice farmer.

Manure Cost (X_6)

Table 5.6 shows that the regression coefficient of manure cost for credit user Boro rice farmer is 0.267 which is positive but insignificant. Table 5.6 also shows that the regression coefficient of manure cost for non-credit user farmer is 0.163 which is positive but insignificant. This indicates that manure cost had no significant effect on the gross return of credit and non-credit user Boro rice farmer.

Irrigation Cost (X_7)

Table 5.6 shows that the regression coefficient of irrigation cost for credit user Boro rice farmer is -0.041 which is negative and significant at 5 percent level. It indicates that considering all other factors constant, 1 percent increase in the cost of irrigation would decrease gross return by 0.041 percent. Table 5.6 also shows that the regression coefficient of irrigation cost for non-credit user farmer is 0.361 which is positive but insignificant. This indicates that irrigation cost had no significant effect on the gross return of non-credit user Boro rice farmer.

5.2.2 Overall performance of the model (R^2, adjusted R^2 and F value)

The coefficient of determination (R^2) is the summary of how well the sample regression line fits the data. Table 5.5 shows that the R^2 value for credit user and non-credit user Boro rice farmers are 0.797 and 0.784 which means that 79.7 percent and 78.4 percent variation in the gross return of credit user and non-credit user of Boro rice was explained by the independent variables included in the model respectively. The values of adjusted R^2 were 0.724 and 0.745 for credit user and non-credit user respectively. This means that after taking into account the degrees of freedom (df), independent variables in the model still explained 72.4 percent and 74.5 percent of the variation in the gross return of credit and non-credit user farmer respectively. The F value for credit users of Boro rice was found 20.35 which were highly significant at 1 percent level indicating the good fit of the model (Table 5.6). The F value for non-credit user of Boro rice was found 19.76 which were highly significant at 5 percent level indicating the good fit of the model (Table 5.6).

5.2.3 Elasticity of Production (Ep)

The elasticity of production function is defined as the percentage change in output in relation to the percentage change in input. The coefficients of the various inputs of credit and non-credit user of Boro rice functions show the elasticity of the respective production function which refers how much of the impact of inputs on the gross return of credit and non-credit user Boro rice can be explained.

The elasticity of input is shown in Table 5.7. It was obvious from Table 5.7 that all inputs were individually inelastic both for credit and non-credit user of Boro rice production. It indicates that the gross return per hectare of credit and non-credit user Boro rice does not change as much with the change of the independent variables.

Table 5.7. Elasticity of Production and Return to Scale

Inputs	Credit Users	Non-credit Users	Remarks
Human Labor cost	-0.045	-0.021	Inelastic
Animal and Mechanical Power Cost	0.035	-0.016	Inelastic
Seed Cost	0.019	0.013	Inelastic
Fertilizer Cost	0.054	0.044	Inelastic
Pesticide Cost	0.385	0.172	Inelastic
Manure Cost	0.312	0.163	Inelastic
Irrigation Cost	-0.041	0.286	Inelastic
Return to Scale (b_i)	0.719	0.641	Decreasing return to scale

(Source: Field survey, 2019)

5.2.4 Return to Scale (RTS)

The total elasticity of production when equal to 1, it refers to constant returns to scale. If total elasticity is greater than 1, it indicates increasing return to scale and when it is less than 1, it refers to decreasing return to scale. Table 5.7 shows that the return to scale for credit and non-credit user of Boro rice were 0.674 and 0.716 respectively which is less than 1. It was obvious that both credit and non-credit user of Boro rice had decreasing return to scale. It implied that both credit and non-credit user of Boro rice farmers were operating in the rational zone of production (stage 2). It implies that an increase in all the variables would lead to a less than proportional increase in gross return. From Table 5.7 it was obvious that if all the variables were increased by 1 percent, the gross return of credit and non-credit user of Boro rice farmers would increase by 0.674 percent and 0.716 percent, respectively.

CHAPTER – VI

PROBLEMS AND CONSTRAINTS FACED BY THE FARMERS OF BORO RICE

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PROBLEMS AND CONSTRAINTS FACED BY THE FARMERS OF BORO RICE

6.1 Problems and Constraints Faced by The Farmers in Production and Getting Credit

Farmer who want to get loan from bank face different problems. The problem facing rate is higher for small farmer than large farmer because of lack of information accessibility, lower education level, long procedure etc which hamper the farmer need of loan for continuing production process smoothly.

6.1.1 Credit Requirement and Disbursement

Table 6.1 shows the average amount of credit requirement by the credit user farmers of three farm categories and actual disbursement for HYV 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 BKB fulfilled on an average 77 percent 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 percent 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.

Table 6.1: Average Requirement and Disbursement Situation of Credit of Different Farm Types

Farm types	Credit requirement (Tk)	Credit received (Tk)	Gap (Tk)
Small	35000	23400	11600(33)
Medium	65000	48900	16100(25)
Large	100000	81800	18200(18)
All Farmer	66667(100)	51367(77)	15900(23)

(Source: Field Survey, 2019)

Note: Figures in the parenthesis are showing the percentages

6.1.2 Cost of Credit

Table 6.2 shows item wise average cost of receiving loans from BKB in the study area. On average the cost of receiving loan from BKB was Tk 5528. Among the major cost items, official cost was significantly lower (e.g., application fee, 3.61 percent) than unofficial costs (96.39 percent). The entertainment cost (58.86 percent) was the highest among all unofficial cost followed by traveling (15.5 percent), food (13.65 percent) and labor cost for getting a loan (8.38 percent). 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.

Table 6.2: Average Cost of Farmers Receiving Credit From BKB

Items of cost	Small farmers	Medium farmers	Large farmers	All farmers
Application fee	200	200	200	200(3.61)
Traveling cost	525	765	1280	857(15.5)
Food cost	275	630	1360	755(13.65)
Labor cost of spend hours	300	450	640	463(8.38)
Entertainment cost	2100	3100	4560	3254(58.86)
Total	3400	5145	8040	5528(100)

(Source: Field Survey, 2019)

Note: Figures in the parenthesis are showing the percentage

6.2 Problems Faced During Production by Credit and Non-Credit Users of Boro Rice Farmers

There were many problems in the study area that affected production as well as profitability of Boro rice production. Farmers were asked about the important problems they face often during production of Boro rice.

Those problems were then ranked and arranged in order based on the priority of the problem. The problems faced by the respondents of credit user and non-credit user Boro rice farmers which were arranged in descending order are shown in Table 6.3.

Table 6.3: Rank Order of the Problems Faced by Credit and Non-Credit User Boro Farmers

Problems	Credit user farmer		Non-credit user farmer	
	Percent	Rank	Percent	Rank
a. High input cost	90.57	1	92.51	1
b. Shortage of labor and high wage rate	83.38	2	87.53	2
c. Low price of output	79.51	3	70.60	4
d. Lack of storage facilities	75.49	4	74.28	3
e. Lack of capital	60.53	5	68.31	5
f. High irrigation cost	61.42	6	48.94	10
g. High transportation cost	58.46	7	66.39	6
h. Poor agronomic practice	51.62	8	50.26	9
i. Attack of pests	50.27	9	54.82	7
j. Natural disaster	41.86	10	53.57	8
k. Lack of extension service	40.17	11	45.68	11

(Source: Field Survey, 2019)

6.3 Problems Faced by The Credit Users of Boro Rice Farmer About Getting Credit

Table 6.4 depicts some constraints for getting a loan by sample farmers in the study areas. About 95 percent creditors said that difficult credit rules of banking institutions obstruct small and marginal farmers to access credit. Credit rules are very complicatedly formulated. In many cases, these are not clearly apprehended by illiterate and partially educated farmers. Most of the farmers (83 percent) 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 82 percent

farmers think that long institutional procedure as another impediment in securing loans from institutional source.

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 60 percent of total respondents. About 55 percent farmers said that the allocation of BKB credit for each farmer was insufficient to meet up the cost of input intensive crop like Boro rice. About 45 percent 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.

Table 6.4: Percentage of Farmers Faced Different Problems During Getting Loan

Constraints	(percent) of farmers
Difficult credit rules	95
Lack of timely loan assistance	83
Long institutional procedure	82
Lack of institutional cooperation	78
Higher non-interest cost of institutional credit	60
Insufficient credit for the creditors	55
Strong need for collateral in institutional sources	45
Poor institutional capability	30
Small and marginal farmers get less priority	28
No loan is sanctioned until repayment of previous credit	23

(Source: Field Survey, 2019)

CHAPTER- VII

SUMMARY, CONCLUSION AND RECOMMENDATIONS

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SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1 Summary and Conclusion

Credit plays a crucial role in the cultivation of input intensive crops like HYV 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 HYV 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.

The present study identified that human labor (-0.045), power tiller cost (0.035) and fertilizer cost (0.054), irrigation cost (-0.041) were significant at 5 percent level of significance for the credit user farmers. It also showed that seed cost (0.019) was significant at 1 percent level of significance. At the same time, it indicated that human labor (-0.021) and fertilizer cost (0.044) were significant at 5 percent level of significance for the non-credit user farmers. It also showed that seed cost (0.013) and power tiler (-0.016) cost were significant at 1 percent level of significance.

The study also revealed that the gross return, net return and gross margin of credit user HYV Boro rice growers was higher than non-credit user HYV Boro rice growers. Furthermore, the benefit cost ratio of credit user HYV Boro rice growers was found higher than non-credit user HYV Boro rice growers. The result revealed that credit user HYV Boro rice growers was more profitable than non-credit user HYV Boro rice growers in the study area.

The top five major problems found in the study were high input cost, shortage of labor and high wage rate, low price of output, lack of storage facilities and lack of capital for production and top four major problems about agricultural credit getting were Difficult credit rules, Lack of timely loan assistance, Long institutional procedure, Lack of institutional cooperation.

7.2 Recommendations

The following recommendations can be suggested to overcome the constraints of Boro rice and getting loan from bank faced by the farmers.

a. Farmers should encourage about organic farming that is more sustainable production, enrich soil fertility, and produce rice that is more nutritious for our health. Government should provide all possible help to supply required amount of organic manure, compost, vermi-compost and capital to the farmers.

b. Initiatives can be taken to make the rural sector more attractive to reduce the migration of labor. If the availability of labor in rural area becomes high in the period of harvesting, the wage rate will automatically reduce.

c. To ensure the fair price and control fluctuation of price of Boro rice, the government should monitor that all of the market maintain at least celling price, access market information and intervene in the procurement and marketing process of Boro rice. Government should take action against stock keepers.

d. Storehouse can be made in rural areas near farmer's field or reduction storehouse rent in the time of harvesting to marketing which may help them to store their product.

e. Government can encourage public and private banks to provide loan at low interest rate to farmers on the time of production for making availability of capital to provide the recommended dose of inputs during production of Boro rice.

f. More infrastructure development like building new and construction of poor road and culvert can reduce the transportation cost.

g. The agricultural extension officers should provide more training and make more access to information on IPM (Integrated Post Management) system and application of

new technologies and new method of cultivation by field visit, arranging agricultural program.

h. Bangladesh bank should monitor the collateral free agricultural credit programs, loan officer should monitor the best use of credit for production and make sure repayment of credit timely.

i. Government should monitor the credit program, make consistency between annual target and disbursement so that the farmer get credit timely for production on the production period.

j. The credit lender authority should be reduced long institutional procedure such as CIB (Credit Information Bureau) report collection, repayment of previous loan if any, NOC (No Objection Certificate) from others bank in that area about credit users etc for disburse loan quickly.

k. The member of institutions should farmers friendly like all procedures completed within very short time, taking no additional money to collect information and for disburse credit. Farmer friendly institutions make smoothing our rice production and keep an eye food security and food sufficiency in our country.

7.3 Scope for Further Research

This present study provides useful information for farmers, researchers and policy makers. However, there were some limitations of time, fund and resources. For this reason, researcher had to consider small sample size. The researcher could not represent any generalized view of economic analysis on profitability of credit and no-credit users of HYV Boro rice production. Thus, further research can be undertaken by considering more sample size and make a generalized comment on this sector.

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APPENDIX

English Version of the Interview Schedule of Boro rice
Department of Poverty and Development Studies
Sher-e-Bangla Agricultural University
Sher-e- Bangla Nagar, Dhaka-1207

Interview Schedule on

"A COMPARATIVE PROFITABILITY ANALYSIS OF CREDIT AND NON-CREDIT USERS OF HYV BORO RICE CULTIVATION IN PAKUNDIA UAZILA OF KISHOREGANJ DISTRICT"

Sample no ……

Study area……

Village …….

Respondent name …….

A. Socio economic information

1. What is your gender? (Please put (√) on the following option)

a. Male b. Female

2. What is your marital status? (Please put (√) on the following option)

a. Married b. Unmarried c. Widow/widower

3. What is your age? (Please put (√) on the following option)

a. 21-30 years b. 31-40 years c. 41-50 years d. 51-60 years e. 61 years and above

4. What is your educational status? (Please put (√) on the following option)

a. Illiterate b. Primary c. S.S.C d. H.S.C e. Graduate/Postgraduate

5. How long have you been involved in farming? (Please put (√) on the following option)

a. 01-10 years b. 11-20 years c. 21-30 years d. 31-40 years e. 41-60 years

6. How many family members do you have? …… Male ……. Female ……

7. Farmers occupational sources (Please put (√) on your occupational source):

Occupation	Main	Subsidiary
Agriculture		
Business		
Service		
Rickshaw or van pulling		
Wage labor		

8. What is the size of your farm? (Please put (√) on the following option)
a. 2 -249 decimal b. 250-749 decimal c. 750 decimal and above

B. Profitability analysis of Boro rice production

1. Human labor requirement (man/day)

Operation	Labor (man-days)		Unit Cost (Tk.)	Total Cost (Tk.)
	Family Labor	Hired labor		
Land preparation				
Transplanting				
Weeding				
Fertilizer and insecticide				
Harvesting				
Threshing				

2. Per hectare material inputs used

Various Inputs	Quantity	Unit price (Tk.)	Total (Tk.)
Seed			
Fertilizer			
Urea			
TSP			
MOP			
Manure			
Pesticide			
Animal labor			
Power tiller			
Thresher			
Irrigation			

3. Land use information

Name of the crop	Land area under cultivation (decimals)	Rental price (Tk.)
Boro rice		

4. Profitability situation of Boro rice

Sources of income	Quantity (maunds)	Price (Tk./maunds)	Total income (Tk.)
Main product			
Rice straw			

C. Problems in Boro rice production and marketing

Problems	Put (√) if you agree
a. Low price of output	
b. Shortage of labor high wage rate	
c. High transportation cost	
d. High input cost	
e. High irrigation cost	
f. Lack of extension service	
g. Lack of storage facilities	
h. Poor agronomic practice	
i. Natural disaster	
j. Attack of pests	
k. Financial constraints	

D. Agricultural credit Condition:

Have you gotten any loan from BKB? (Yes ……., No ……)

1. Requirement and disbursement situation of credit of different farm types:

Farm size	Credit requirement (Tk)	Credit received (Tk)	Gap (Tk)
Small			
Medium			
Large			
All farmers			

2. Farmers cost of receiving loan from BKB:

Item of cost	Small farmers	Medium farmers	Large farmers	All farmers
Application fee				
Travelling cost				
Food cost				
Labor cost of spend hours				
Entertainment cost				
Others				

3. Constraints of getting loan:

Constraints	
Insufficient credit for the creditors	
Higher non-interest cost of institutional credit	
Strong need for collateral in institutional sources	
Difficult credit rules	
Lack of timely loan assistance	
Long institutional procedure	
Lack of institutional cooperation	
Poor institutional capability	
Small and marginal farmers get less priority	
No loan is sanctioned until repayment of previous credit	

Date …….

Name of the interviewer ……..

APPENDIX-II

Share of Agriculture to GDP (%) of Bangladesh

Fiscal Year	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019	2019-2020 (p)
Agricul -ture	17.0	16.8	16.1	15.4	15.3	14.7	14.1	13.8	13.3	13.02

(Source: BBS, 2019)

Share of Aus, Aman and Boro Rice Production to The Total Production

Year	Area ('000, hactors)			Production ('000.MT)			% of total production		
	Aus	Aman	Boro	Aus	Aman	Boro	Aus	Aman	Boro
2011-2012	1120	5850	4750	2300	12800	18600	6.91	37.98	55.19
2012-2013	1150	5750	4750	2400	12800	18800	7.06	37.64	55.29
2013-2014	1200	5850	4700	2500	13200	18500	7.30	38.60	54.09
2014-2015	1045	5530	4841	2328	13190	19192	6.71	38.00	55.29
2015-2016	1018	5590	4773	2288	13484	18938	6.59	38.85	54.56
2016-2017	1098	5900	4750	2338	13350	18890	6.76	38.61	54.63
2017-2018	1100	5700	4472	2350	12500	17800	7.20	38.28	54.52
2018-2019	1145	5873	4752	2500	13500	18909	7.16	38.67	54.17
2019-2020	1175F	5880F	4775F	2600F	13600F	19100F	7.37	38.53	54.11

(Source: Bangladesh Economic Review, 2020)

APPENDIX-III

Distribution of Sample Farmers According to Age Group

Farmers age (Years)	Credit user		Non-credit user		All farmer	
	No of farmer	Percent (%)	No of farmer	Percent (%)	No of farmer	Percent (%)
21-30	8	26.67	7	23.33	15	25
31-40	12	40	11	36.67	23	38.33
41-50	4	13.33	6	20	10	16.67
51-60	3	10	4	13.33	7	11.67
60 and above	3	10	2	6.67	5	8.33
All group	30	100	30	100	60	100

(Source: Field survey, 2019)

Educational Status of the Respondents

Educational status	Credit user		Non-credit user		All farmers	
	No of farmer	Percent (%)	No of farmer	Percent (%)	No of farmer	Percent (%)
Illiterate	21	70	25	83.33	46	76.67
Primary	6	20	4	13.33	10	16.67
Secondary	2	6.67	1	3.33	3	5
Higher Secondary	1	3.33	0	0	1	3.33
Graduate/Postgraduate	0	0	0	0	0	0
Total	30	100	30	100	60	100

(Source: Field survey, 2019)

APPENDIX-IV

Distribution of Sample Farmers According to Farming Experience

Years of experience	Credit user		Non-credit user	
	No of farmer	Percent (%)	No of farmer	Percent (%)
1-10	5	16.67	4	13.33
11-20	11	36.67	14	46.67
21-30	8	26.67	7	23.33
31-40	4	13.33	4	13.33
41-50	2	6.67	1	3.33
Total	30	100	30	100

(Source: Field survey, 2019)

Per Hectare Operation Wise Average Cash Cost for Boro Rice Production

Cost items	Credit user			Non-credit user
	Self-financing (SF)	Credit Financing (CF)	Total	
Human labour (Hired)	11245.56 (16.80%)	17375.48 (25.96%)	28621.04 (42.77%)	26432.87 (42.93%)
Animal & mechanical power	2275.48 (3.40%)	4624.16 (6.91%)	6899.64 (10.31%)	7243.63 (11.77%)
Seed	2387.59 (3.57%)	-	2387.59 (3.57%)	2281.58 (3.71%)
Fertilizer & manure	5678.37 (8.48%)	6254.31 (9.35%)	11932.68 (17.83%)	9754.62 (15.84%)
Insecticides	243.29 (0.36%)	1628.98 (2.43%)	1872.27 (2.80%)	1643.27 (2.67%)
Irrigation	6243.76 (9.33%)	8967.82 (13.40%)	15211.58 (22.73%)	14211.28 (23.08%)
Total	28074.05 (41.95%)	38850.75 (58.05%)	66924.80 (100.00)	61567.25 (100.00)

(Source: Field survey, 2019)

Note: Figures in the parenthesis are showing the percentages

Correction Table

SI NO	Reg. No	Name of the Student	Comment from External and Internal Examiner	Page No	Remarks
1.	11-04551	Nandita Rani Saha	Use reference, use covid-19 rather corona	1	
2.			Draw a line graph in case of time series data, reference not found in reference list	2	
3.			Reference not found in reference list , draw a line graph in case of time series data	3	
4.			Reference not found in reference list	9	
5.			Space is missing, reference not found in reference list	11	
6.			Capitalization	18	
7.			Replace table to figure, use past tense	21	
8.			Same tense should be followed	25	
9.			Replace table to figure, use past tense, space before percent	26	
10.			Replace table to figure, space before percent	27	
11.			Replace table 4.11 to table 5.3	30	
12.			Why IOC is fixed cost?	34	
correction after presentation					
13.			Recommendation should be specified	49-50	