

**IMPACT OF SPECIALIZED AGRICULTURAL CREDIT  
ON ONION PRODUCTION IN SOME SELECTED  
AREAS OF PABNA DISTRICT**

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**JUNE, 2021**

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ONION PRODUCTION IN SOME SELECTED AREAS OF PABNA  
DISTRICT**

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**REGISTRATION NO.: 14-06284**

A Thesis

Submitted to the Department of Agricultural Economics, Sher-e-Bangla Agricultural University, Dhaka-1207, in partial fulfillment of the requirements for the degree of

**MASTER OF SCIENCE**

**IN**

**AGRICULTURAL ECONOMICS**

**SEMESTER: JANUARY-JUNE, 2021**

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## CERTIFICATE

*This is to certify that the thesis entitled “**IMPACT OF SPECIALIZED AGRICULTURAL CREDIT ON ONION PRODUCTION IN SOME SELECTED AREAS OF PABNA DISTRICT**” submitted to the Department of Agricultural Economics, Sher-e-Bangla Agricultural University, Dhaka-1207, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE (MS) in AGRICULTURAL ECONOMICS**, embodies the result of a piece of bona fide research work carried out by **MD. MAHEDI HASSAN**, Registration No. **14-06284** 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.*

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**Supervisor**

DEDICATED TO  
MY BELOVED  
PARENTS

# **IMPACT OF SPECIALIZED AGRICULTURAL CREDIT ON ONION PRODUCTION IN SOME SELECTED AREAS OF PABNA DISTRICT**

## **ABSTRACT**

The study is conducted to have a realistic understanding of factors affecting access to specialized agricultural credit (SAC), utilization pattern and impacts of SAC on onion production. Some descriptive statistics have been used to assess the socio-economic profile of the farmers. Then the binary discrete choice model (logit model) is used to find out the determinants of access to SAC. To explore the utilization pattern of SAC for onion cultivation mostly descriptive statistics is used. Finally the Cobb–Douglas production function is applied to evaluate the impact of SAC on onion production. To conduct the study, primary data has been collected from Sujanagar and Santhia upazila of Pabna district. A total of 80 onion cultivators have been interviewed using a well-structured questionnaire. It is observed that, majority of the sample farmers fall in the category of medium farmer (73.75 percent), were between the ages of 36 and 45 years old (35 percent), have a primary level of education (46 percent) and the average family size is 5.42 in the study area. The logit model analysis indicates that among the socio-economic determinants, farmer’s education level, family size, farm size, and farming income were positive and significantly influenced farmers’ access to SAC. The findings of the study reveals that, farmers in the study area utilized their maximum part of SAC for onion cultivation (88.38 percent) followed by other crop cultivation (5.13 percent), family expenditure (4.12 percent) and livestock production (2.37 percent). The study results indicates that those farmers who use SAC in onion cultivation, their per hectare production of onion is 7.13 percent higher compared to those who don’t use SAC. Majority of the farmers (77.5 percent) mentioned lack of information and knowledge about SAC as the main reason behind not receiving credit facility. Thus, efficient disbursement of the credit among farmers through widespread dissemination of information and proper policy management can be an effective way to increase domestic onion production and to reduce the country’s import dependency.

## ACKNOWLEDGEMENT

To begin, I would want to express my gratitude to Allah, the most compassionate and kindhearted, the most kind and benevolent, who deserves all praise. All thanks is due to the almighty, omnipresent, and omniscient Allah, who allowed me to continue my studies in Agricultural Economics and to successfully finish the research and writing of my thesis for the Master of Science in Agricultural Economics degree.

Now, I would like to express my inexpressible gratitude to my Supervisor, **Dr. Ripon Kumar Mondal**, Associate Professor and Chairman, Department of Agricultural Economics, Sher-e-Bangla Agricultural University, Dhaka-1207, for his ever-inspiring guidance, scholarly comments, and constructive suggestions throughout the research process and thesis preparation. Without his insightful intellectual counsel, precise constructive criticism, and assistance, this job would never have been completed. I would like to express my gratitude to my respected Co-supervisor, **Dr. Rokeya Begum**, Professor, Department of Agricultural Economics, Sher-e-Bangla Agricultural University, Dhaka-1207, for her proper guidance, inspiring co-operation, and encouragement throughout the research process and thesis preparation.

Additionally, I am highly grateful to my honorable teacher, Dr. Md. Sadique Rahman, Associate Professor, Department of Management and Finance, Sher-e-Bangla Agricultural University, Dhaka-1207, for his kind support and guidance during questionnaire design and data collection of the research work.

My gratitude and indebtedness to all the honorable course instructors and officials of the Department of Agricultural Economics, Sher-e-Bangla Agricultural University, Dhaka-1207, for their kind help and co-operation in various stages towards completion of this research work.

I'd want to convey my profound admiration to the 80 onion cultivating farmers who participated actively in this survey and, more significantly, helped me understand their efforts and actions linked to onion cultivation in general and their experience towards specialized agricultural credit for onion production in particular. They contributed critical data that were used to develop several models for identifying the factors affecting access to specialized agricultural credit and exploring the utilization

pattern, impact of agricultural credit on onion production. Their amazing assistance and cooperation throughout the data gathering procedure is much appreciated; without their willingness to contribute information, this study would not have been feasible.

I would also want to convey my heartfelt gratitude to agricultural extension officers, local representatives and Rajshahi Krishi Unnayan Bank (RAKUB) officials of the selected study areas for their assistance throughout the data gathering procedure even in pandemic situation.

I also like to take the opportunity to express my gratitude and sincere thanks to my beloved friend, Sharanon Chakma, MS student, Department of Development and Poverty Studies, Sher-e-Bangla Agricultural University, Dhaka-1207, who have continuously helped in improving the research work arrangement by providing necessary technological support and guidance.

I would like to extend my gratitude to Ministry of Science and Technology, Government of People's Republic of Bangladesh, for granting me National Science and Technology (NST) Fellowship 2019-2020 as financial backing of my MS thesis work, which was a great aid in conducting the study successfully.

I am at a loss for words to express my gratitude to my parents for their unwavering devotion and unflinching support, for their sacrifice and unflinching efforts to accomplish my ambition of obtaining a higher education. They served as a continual source of inspiration throughout the most trying periods of my study.

JUNE, 2021

THE AUTHOR

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## ACRONYMS AND ABBREVIATIONS

BB	: Bangladesh Bank
BBS	: Bangladesh Bureau of Statistic
DAE	: Department of Agricultural Extension
etc.	: and so on (et cetera)
<i>et al.</i>	: and others (at elli)
FY	: Fiscal Year
GDP	: Gross Domestic Product
ha	: hectare
HYV	: High Yielding Variety
MoP	: Muriate of Potash
MT	: Metric Ton
No.	: Number
RAKUB	: Rajshahi Krishi Unnayan Bank
SAC	: Specialized Agricultural Credit
Tk.	: Taka
TSP	: Triple Super Phosphate
UAO	: Upazila Agricultural Officer
VAT	: Value Added Tax
WB	: World Bank
%	: Percent

# CHAPTER 1

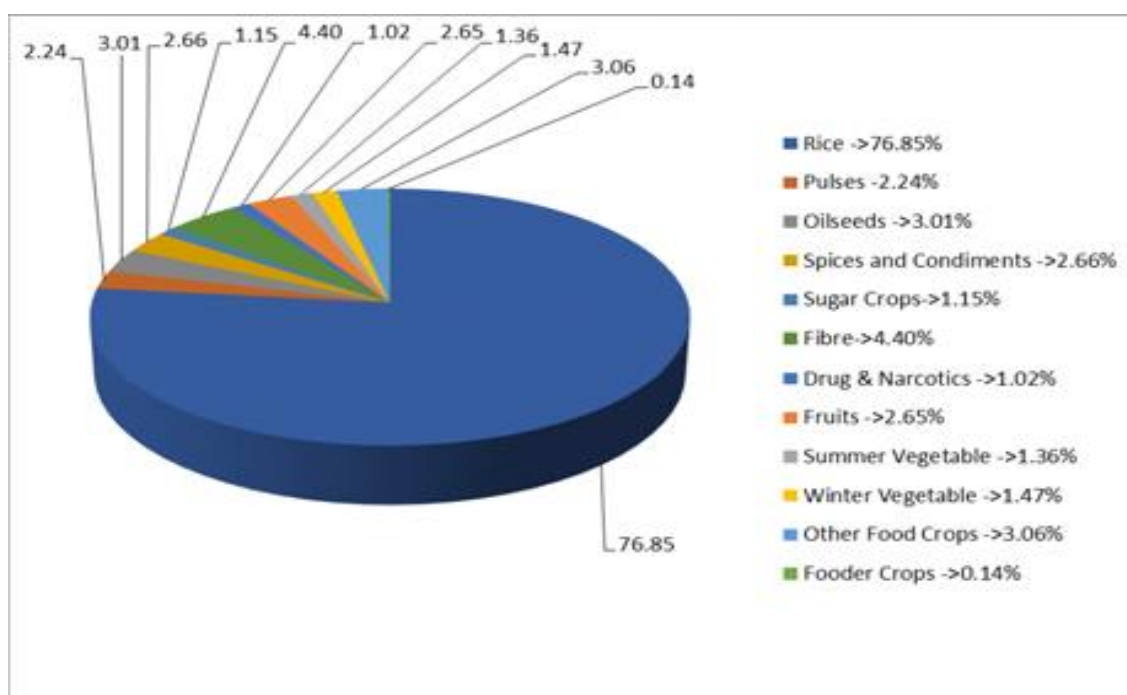
## INTRODUCTION

### 1.1 Background of the Study

Bangladesh is predominantly an agricultural country. To feed 163.65 million people, it mainly depends on agriculture. Agriculture is the single largest producing sector of the economy and according to BBS report May 2021, contribution of the agriculture sector in fiscal year (FY) 2017-18, FY 2018-19 and FY 2019-20 to the country's Gross Domestic Product (GDP) is 14.23 percent, 13.65 percent and 13.35 percent while growth rate of agricultural GDP is 4.19 percent, 3.92 percent and 3.11 percent respectively. This sector also employs around 40.60 percent of total labor force (BBS, 2018). The country's GDP growth in FY 2017-18, FY 2018-19 and FY 2019-20 stood at 7.86 percent, 8.15 percent and 5.24 percent. The growth in GDP edged down to 5.24 percent in the FY 2019-20 due to Covid-19 fallout (BBS, 2021).

Though the agriculture sector's contribution to yearly GDP has steadily declined due to the expansion of other productive sectors, most notably textiles and manufacturing, the sector continues to play a critical role in the country's economic growth. Till present, agriculture is the single largest source of income and employment and a critical component of the country's claim to food self-sufficiency, rural poverty reduction and sustainable economic development.

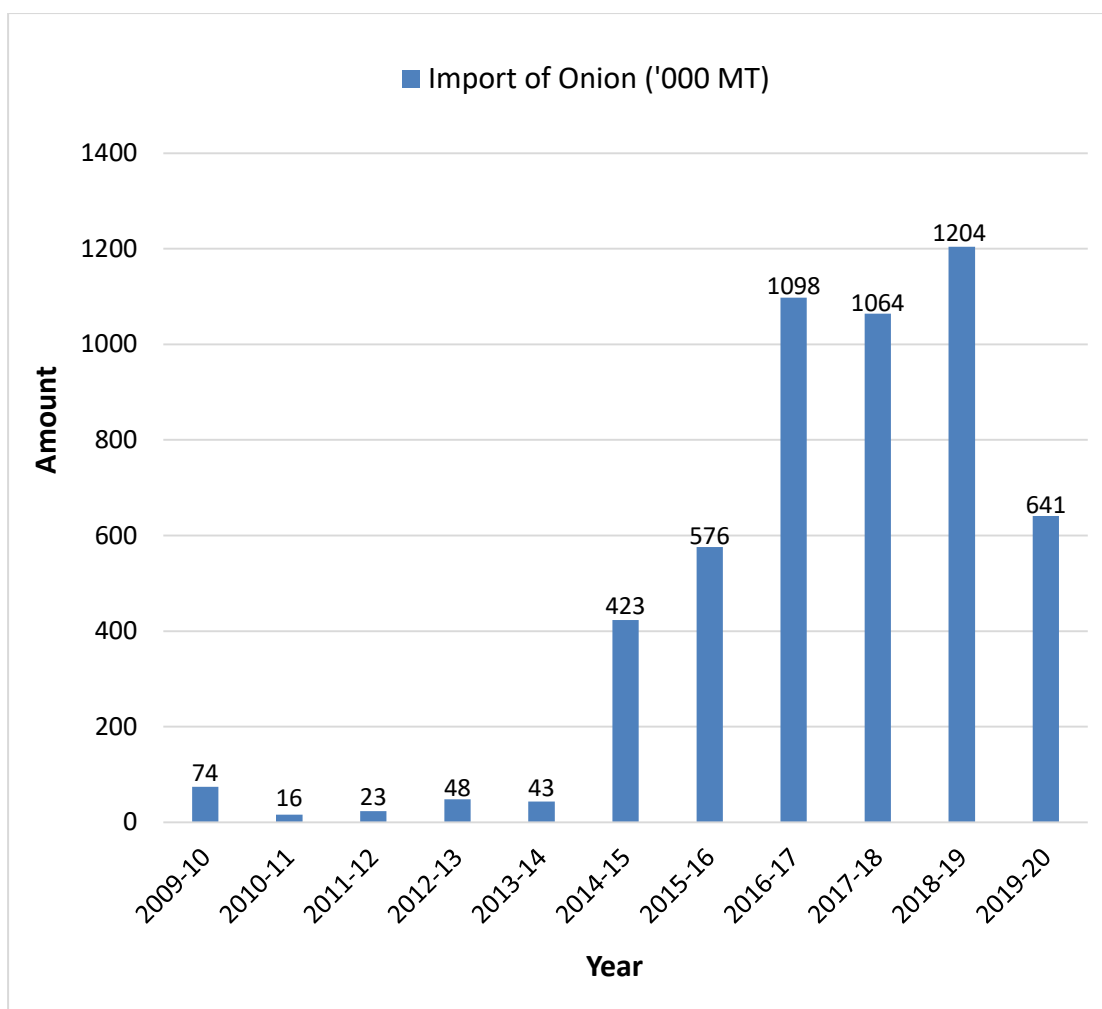
Rice, jute, sugarcane, vegetables, wheat, tea and maize are the principal crops of Bangladesh and farmers of Bangladesh are traditionally inclined to rice production (BBS, 2021). Over the past few years, farmers became interested gradually in cultivating import substitute crops (such as spices, pulses, oilseed and maize) due to the massive promotional activities regarding specialized agricultural credit (SAC) disbursement (at a concessional 4 percent interest rate for the aforesaid crops) program done by Bangladesh Bank (BB, 2020).



Source: BBS, 2021

**Figure 1.1: Area under Cultivation of Different Crops in Bangladesh, 2019-2020**

Among the import substitute crops, spices production has a great potential in Bangladesh (Figure-1.1). In Bangladesh, the total cultivated land under spices cultivation in the year 2019-20 is 1046 thousand acres and production is 2998 thousand metric tons (BBS, 2021). The major spices cultivated and consumed in Bangladesh are onion, garlic, chili, ginger, coriander, turmeric, black cumin and fenugreek (Khatun et al.,2017). Among the spices, production, consumption and import of onion is higher (BBS, 2021). In the year 2019-20, area of onion cultivation in Bangladesh is 458 thousand acres and production is 1954 thousand metric tons which is comparatively more than other spices (BBS, 2021). But this production is not available to meet the demands of rapidly growing population of Bangladesh.



Source: BBS, 2021

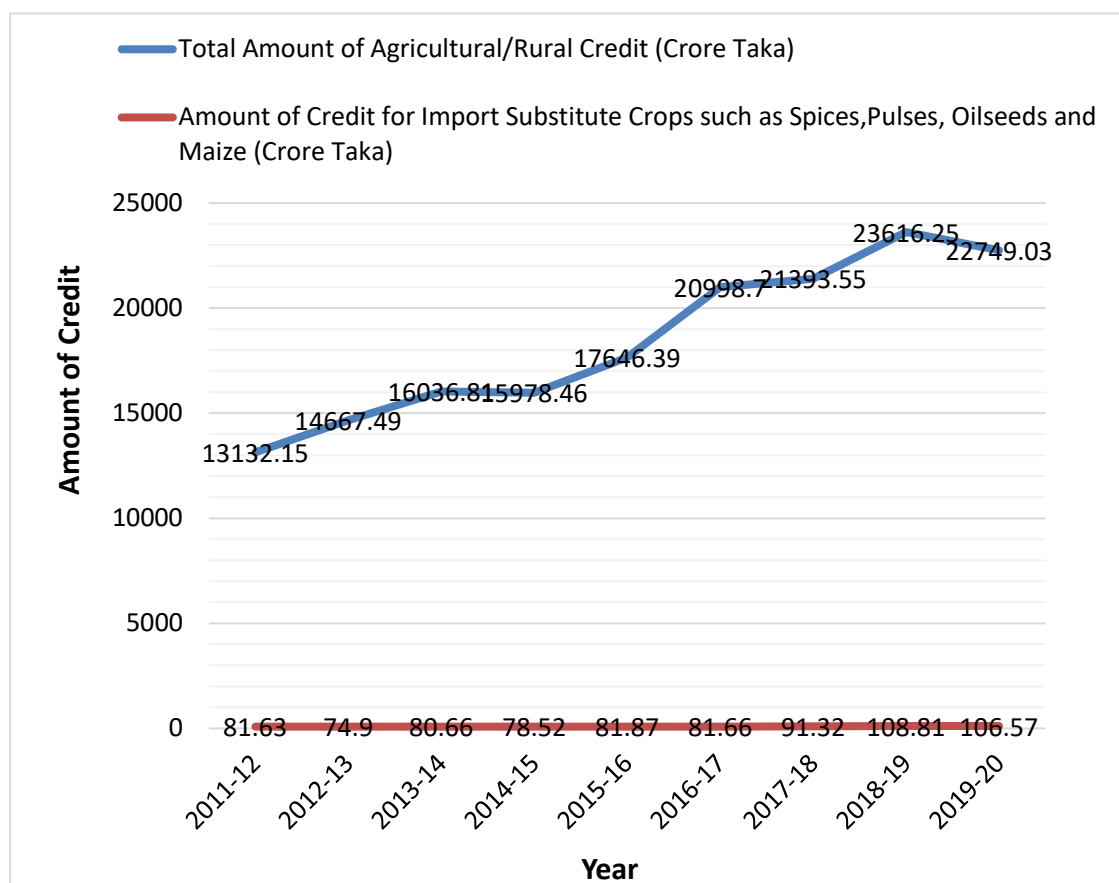
**Figure 1.2: Import of Onion in Bangladesh, 2009-2010 to 2019-2020**

According to the BBS Report May 2021, Bangladesh imports about 25 percent of its total consumption of onion in the fiscal year 2019-20. As a developing country Bangladesh still is dependent on agriculture in all economic aspects and is now on the threshold of attaining self-sufficiency in food grain production, this importance necessitates to give proper care and concentration towards development of the sector.

Realizing this situation, Bangladesh government has taken initiative (special credit program on spices cultivation) to reduce the import of spices by increasing domestic production. In the fiscal year 2011-12, the government re-fixed 4.0 percent rate of interest in place of the earlier rate of 2.0 percent, on specialized agricultural credit (SAC), to be disbursed for cultivation of spices, pulses, oilseed and maize. The

government decided to give subsidy to the banks at 5 percent of the amount of their special agricultural-credit disbursement to enable them to get an aggregate of 9 percent as rate of interest by disbursing such credit to the farmers (BB, 2020).

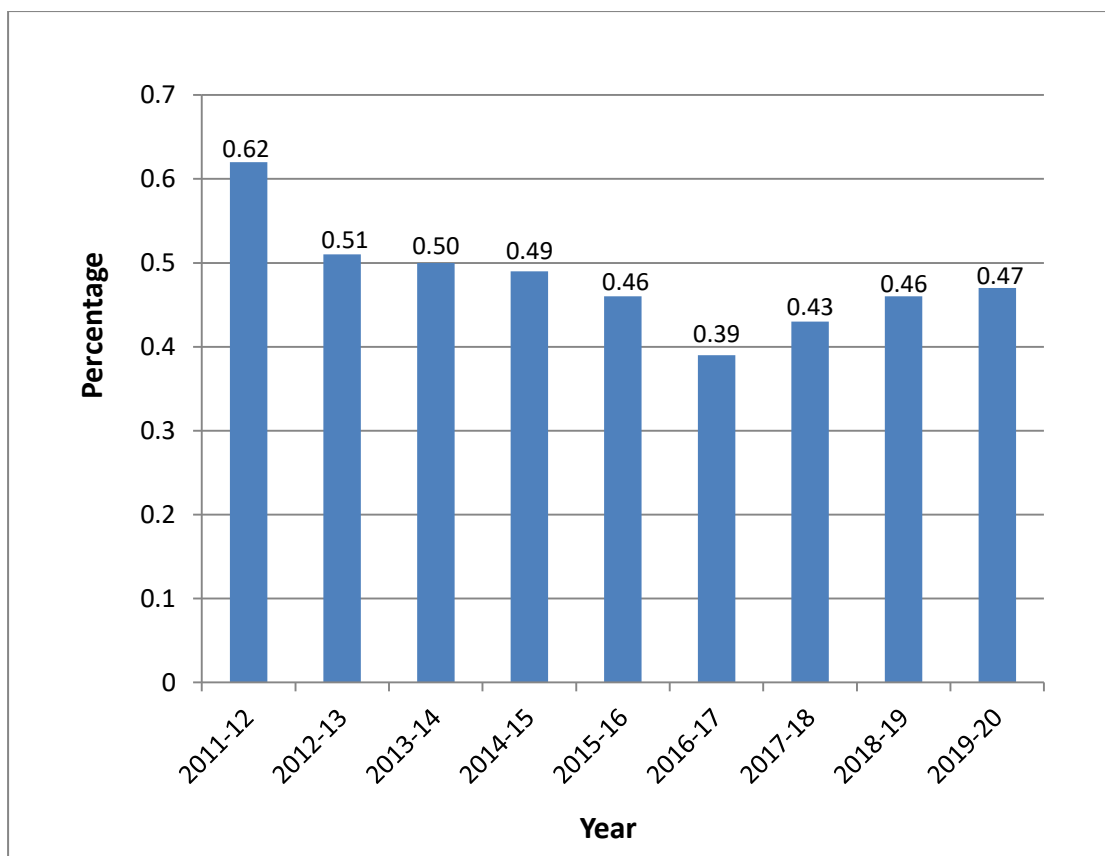
Over the years Bangladesh Bank disbursed credit for import alternative crops cultivation (such as spices, pulses, oilseed and maize), referred as specialized agricultural credit (SAC) but in a small amount. During the fiscal year 2019-20, 06 State-owned Commercial Banks, 02 Specialized Banks, 38 Private Commercial Banks, 08 Foreign Banks have disbursed a total amount of agricultural/rural credit of Tk. 22,749.03 crore (BB, 2020). In which only Tk. 106.57 crore was for SAC which was 0.47 percent of the total agricultural/rural credit (Figure-1.3).



Source: BB, 2020

**Figure 1.3: Agricultural/Rural Credit Disbursed in Bangladesh, 2011-2012 to 2019-2020**

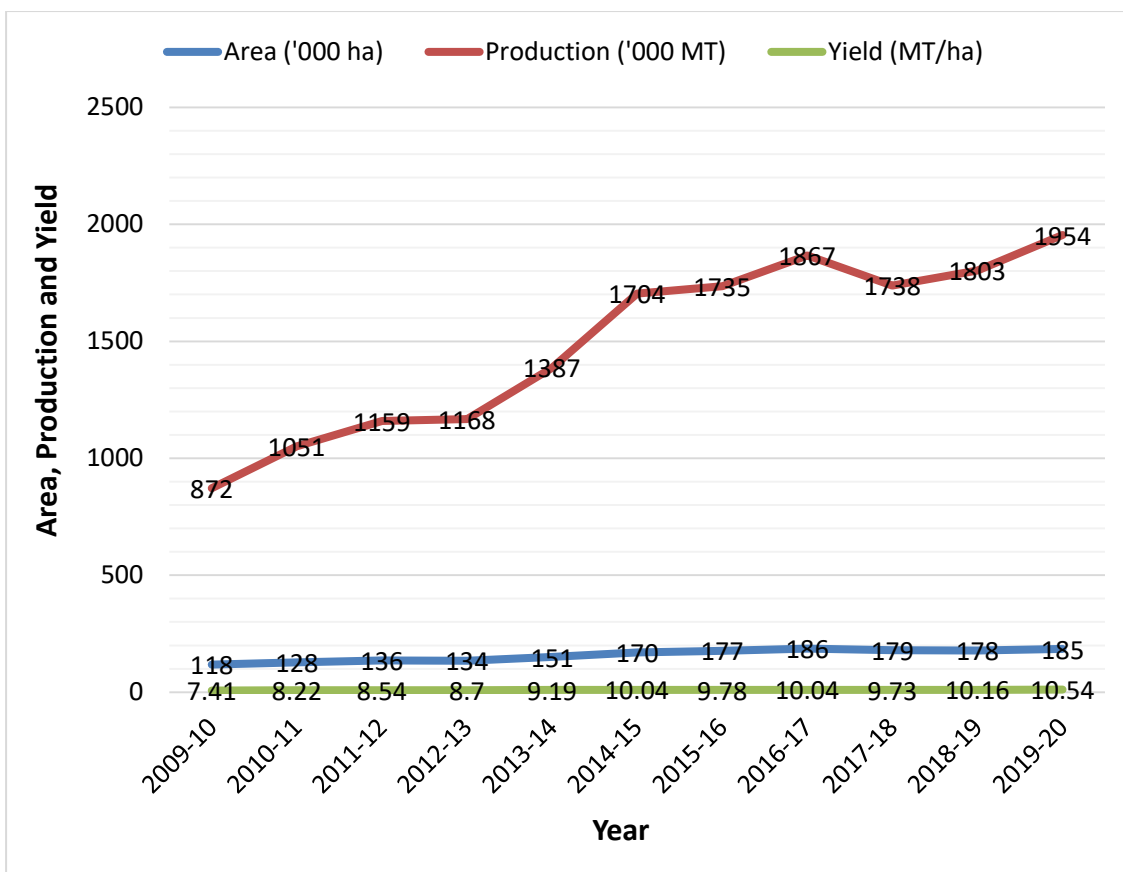




Source: BB, 2020

**Figure 1.4: Percentage of Credit on Import Substitute Crops to the Total Agricultural /Rural Credit in Bangladesh, 2011-2012 to 2019-2020**

Though the amount of credit disbursed by the government for cultivating import substitute crops is too little (0.47 percent of the total agricultural/rural credit in the FY 2019-20) (Figure-1.4), the area of onion cultivation and the production of onion are increasing year after year (Figure-1.5).



Source: BBS, 2021

**Figure 1.5: Area, Production and Yield of Onion in Bangladesh, 2009-2010 to 2019-2020**

The success of any Government policy intervention depends on its dissemination and effective usage among the potential users. Farmer's easy access to agricultural/rural credit facility can be a very pivotal factor for having a comparative advantage over capital constraints in farming practices. Through the proper implementation and disbursement of agricultural credit facility, domestic production of onion can be increased and import of onion may be reduced to a substantial level.

## 1.2 Justification of the Study

Onion is the most important and commonly produced spice crop in Bangladesh. The policy makers and economists are putting great emphasis on the rapid productivity of

onion with a view to for meeting up the demand of the increasing population of our country and to reduce the import dependency. To meet this target, agricultural credit should be made available and sufficient enough to increase domestic onion production. But it is highly concerning that the use of agricultural credit is seldom rapid among the farmers. Farmers of our country are not aware enough and amount of credit disbursed for such crops cultivation (0.47 percent of the total agricultural/rural credit in the FY 2019-20) is not sufficient enough to meet the actual demand of the farmers.

Credit is the basic component of all economic activities like agriculture. It is argued that relaxing the credit constraint for farming enterprises permits and enables the farmers to invest in modern methods of cultivation, marketing, storage, and other farming activities. Availability of adequate agricultural credit affect crop productivity in the way it facilitates the farmers to purchase essential and improved farm inputs at the sowing time (Chandio et al.,2017).

Moreover, credit has ability to enhance the living standard of poor farmers and can help them come out of their poverty traps (Saboor et al.,2009). Agricultural credit remains one of the most important factors that provide an opportunity to the farmers for sufficient use of inputs, adoption of modern technologies and more proper allocation of resources to enhance food security and eradicate poverty (WB, 2003). According to the WB report 2007, agricultural GDP growth is at least twice as effective in reducing poverty as GDP growth in other sectors. It means if a 1percent increase in GDP in any non-farm sector can lead to a reduction of poverty by 1percent, the poverty reduction will be 2percent with 1percent growth in the agricultural GDP (WB, 2007).

On the contrary, lack of capital for investment in farming is often considered as the main constraint in terms of proper utilization of the poor farmers economic potentials. The lack of credit also acts as a vital impediment to savings-investment activities, employment generation, consumption behaviors, etc. of the rural poor farmers. Therefore, Financing of agricultural production, especially through the provision of agricultural credit to small-scale and marginal farmers, remains the key to macroeconomic development induced by agriculture (Anetor et al.,2016). It is also

evident that government policy intervention's contribution to any specific sectors growth can only be recognized when and if it is broadly disseminated and utilized.

That's why, it is essential to have a clear and realistic understanding of the specialized agricultural credit (SAC) policy intervention and its outcome to ensure proper implementation of the SAC scheme. It is also important to assess the socio-economic characteristics of the farmers to ensure widespread and efficient disbursement of agricultural credit facility. But only a few studies have been done in Bangladesh regarding impact of specialized agricultural credit on agricultural crops production.

Therefore, the present study is initiated with intent of determining the factors affecting access to specialized agricultural credit (SAC), understanding the utilization pattern of SAC and evaluating the impact of SAC on onion production.

### **1.3 Objectives of the Study**

In light of the aforementioned issues, the following particular objectives have been devised to provide the research with correct direction:

- i. To assess the socio-economic profile of the onion cultivators;
- ii. To identify the factors affecting access to specialized agricultural credit;
- iii. To explore the utilization pattern of specialized agricultural credit for onion cultivation; and
- iv. To evaluate the impact of specialized agricultural credit on onion production.

### **1.4 Scope of the Study**

This particular study is conducted to have a realistic understanding of factors affecting access to specialized agricultural credit (SAC), utilization pattern of SAC and impacts of SAC on onion production. The potential scope might be sum up like below:

- i. The study will help in understanding socio-economic characteristics of the onion cultivators.
- ii. The study will aid in determining the factors that influence farmer's choice of using and access to specialized agricultural credit for onion cultivation.

- iii. The results of the study are expected to be helpful for the farmers in providing a basis for their production plans and decisions in onion cultivation.
- iv. The study may also encourage the onion cultivators to use specialized agricultural credit by make them understand the comparative advantage of using SAC.
- v. The current study will aid individual researchers who will conduct similar studies in the future. The findings of the study may stimulate more complete and extensive research in this area of study.
- vi. The findings of the study may also be helpful to the policy makers in learning about various problems and prospects related to agricultural credit policy implementation for onion production.
- vii. The study will assist policy makers in recommending and providing benefits for farmers, and encouraging farmers to use specialized agricultural credit in onion cultivation.
- viii. The findings of the study are expected to be helpful to the field workers, extension service workers and bank officials to develop appropriate extension strategies for effective working with the rural farmers.
- ix. The findings of the study may also be beneficial to the policy makers to implement the SAC program in a feasible and effective manner. Thus, the study may help policy makers in further improvement of the program.

### **1.5 Assumptions of the Study**

“An assumption is a presumption that an apparent fact is true in principle, given the available evidence” (Good, 1945). While conducting the study, the researcher prioritized the following assumptions:

- i. The respondents included in the sample were really representative of the targeted demographic.
- ii. The respondents included in the study's sample were adequately competent of responding to the interview schedule's questions and expressing their thoughts.
- iii. The respondents' responses were recognized as substantial and trustworthy.

- iv. The researcher, the interviewer, was socially and culturally well-acclimated to the study location. Hence, the responses were objective.
- v. The findings of the study are expected to have general applications to other parts of the country

## **1.6 Limitation of the Study**

Considering the time, money and other necessary resources available to the researcher and to make the study manageable, the researcher had to impose several limitations, including the following:

- i. The study was confined to two upazilas named Sujanagar and Santhia of Pabna district.
- ii. Due to time constraints and other resource constraints, the researcher was forced to work with tiny sample numbers, only 80 respondents were interviewed for this study.
- iii. Out of many characteristics of onion cultivators only a few characteristics were selected for investigation in this study.
- iv. During fertilizer cost calculation in chapter-3 equation-(2), only cost of using chemical fertilizers is considered.
- v. The researcher had to rely entirely on the farmers' recollection for the essential information since they did not retain written records of their on-farm operations throughout the production and selling. As a result, respondents were probed within the confines of their memory in order to recall the right responses to the queries posed.

## CHAPTER 2

### REVIEW OF LITERATURE

In this chapter, an attempt has been made to review of pertinent literature keeping in view the problem entitled, “**Impact of Specialized Agricultural Credit on Onion Production in Some Selected Areas of Pabna District**”. 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. Review of some research works relevant to the present studies are discussed below.

**Alam (1988)** investigated the productivity growth of farmers with access to microfinance and showed that microfinance has a great influence on agriculture production. The key finding was that the small and marginal farmers as a result of participating in the bank’s credit programs could allocate a higher percentage of their land for the cultivation of high-yielding varieties (HYV) and consequently, improved productivity. His studies revealed that the users of microfinance can bring 81.5 percent of their cultivable land under HYV production compared to 76 percent of the non-users.

**Carter (1989)** argued that credit affects agricultural overall performance by relaxing the working capital constraints, inducing farmers to adapt to the new technologies and indulge in intensive use of fixed resources. Availability of credit enables the farmers to manage their land and other fixed assets, to smooth the consumption during the crop production cycle, and thereby, raise the farm productivity and reduce dependence on high cost informal markets.

**Zuberi (1989)** observed that agricultural development depends on the maximum utilization of better and low cost technology. In her study she suggested that government should provide the institutional credit in a simple and easy procedure to make possible for farmers to purchase modern implements and use the modern methods of production. She additionally concluded that the use of modern agricultural technology and additional inputs are necessary for rising productivity.

**Feder et al. (1990)** conducted an econometric analysis to examine the effect of credit on output supply. They reported that the amount of credit desired and the amount offered are not necessarily equal. Their study findings also confirmed that informal credit is not a good substitute for formal credit. Their study highlighted two important factors which should be considered when evaluating the likely impact of agricultural credit expansion: (a) Not all farmers are constrained in their farming operations by inadequate credit; (b) expanded supplies of formal credit will be diverted in part to consumption, thus the likely output effect will be smaller than that which is expected when all funds are assumed to be used productively.

**Von Braun et al. (1993)** showed that smallholders having access to formal credit have 37 percent higher input expenditures than those who do not have access to formal credit. They found negative impact of lack of access to credit on farm production in developing countries. They concluded that agricultural productivity can be boosted through the timely availability of credit which enables farmers to purchase farm inputs like high yield seeds, fertilizers, pesticides and modern farm machinery.

**Elahi and Rahman (1995)** concluded that credit is not an input in production, rather credit affects production through influencing the demand for inputs used in the production process. In their research they observed some interesting results relevant to agricultural credit. Impact of credit is located to be higher in those crops where cost of production and use of purchased inputs are higher.

**Iqbal et al. (2003)** recommended that the formal financial institution should be encouraged to expand the agriculture loans for farming sector especially small-scale farmers. Their study also indicated that the institution should expend the loan for consumption in case of emergencies (flood and drought and many others). Findings of their study recommended that, in addition to a crop insurance, other schemes should also be launched to provide protection to the farmer against the pest attack, drought, heavy rains and flood) on payment of minimum premium.

**Khandker and Faruquee (2003)** found that agricultural loan disbursed to small-scale farmers is more effective and it is also suitable for farm production than that disbursed to the large-scale farmers. Their study reported that, the loans given to small-scale farmers are proved to be more productive than those given to the large-scale farmers.



They concluded that, it also played a very important role in the development of the lifestyle of the small-scale farmers and in reducing their poverty too.

**Javed et al. (2006)** found the impact of credit positive and significant on wheat and sugarcane crop in Punjab, Pakistan.

**Bashir et al. (2007)** examined the impact of credit disbursed by commercial banks on the productivity of sugarcane in faisalabad district, Pakistan using Cobb Douglas production function. Findings of their study revealed that the credit has a positive impact on the productivity of sugarcane. According to their study results, the coefficient of credit ( $\ln$  credit) is 0.004, with a t-value of 2.220 which is significant at 3 percent level of significance. This explains that with 1 percent increase in the tendency to take credit increases the yield of sugarcane by 0.4 percent.

**Chachar (2007)** found that credit is the need of both subsistence and economic land holders for production and development. He observed that the small farmers are hesitating to avail credit facilities from formal institutions due to complicated and lengthy procedure. They prefer to purchase the input on double prices payable after the marketing of their produce.

**Khan et al. (2007)** stated that the unavailability of financial resources to farmers in the developing countries is one of the principal constraints to increase farm production. In their study, the importance of agricultural credits especially from the institutional resources is widely identified as affective device to enhance agricultural productivity. Keeping in mind the effective role of timely availability of financial capital to the farmers; their study was designed to analyze the impact of short-term credit on farm production. The main findings of the study suggested that short-term agricultural credit has positive impact on wheat, gram and livestock production. It is recommended in their study that, Bank should expand the short-term credit programme and increase the credit limits so that larger number of farmers could benefit from the credit programme of the bank. Their study concluded that, the availability of credit to small farmers has improved production per unit area. However, the study found that the amount of credit available to the farmers was not enough to fully meet the actual requirements of the farmers. Furthermore the amount of credit was not sufficient to entertain all the applicants positively. Most of the

potential farmers who were credit worthy, turned out to be unsuccessful due to unavailability of the credit amount anymore.

**Nasir (2007)** cited that agricultural credit played an important role in agriculture development. He revealed that, it helps smallholders to undertake new investments and adopt new agricultural technologies to enhance agricultural productivity. Lack of access to formal credit has a negative effect on farm production and well-being of the rural farmers.

**Sriram (2007)** supplied an evidence of strong positive correlation between agricultural credit at reasonable costs and agricultural production.

**Huda et al. (2011)** conducted a study to evaluate the impact of the agricultural credit and to identify the current status of spice crops in relation to production, area, yield, consumption and marketing system of spice crops in the selected area in Bangladesh. They observed that agricultural credit under the government Action Plan has been successfully generated positive impact on cropping system and socio-economic condition.

**Shah et al. (2008)** stated in their study that finance is considered as the basic ingredient for each and every economic activity including agriculture. Especially in the economy where agriculture is at the subsistence level, this problem is very severe. Therefore the responsibility of the government is to support the agriculture sector. For this purpose the authorities should extends institutional credit to those who can't afford to fully utilize the available technology.

**Bashir et al. (2009)** explored the impact of credit disbursed by commercial banks on the productivity of wheat in Faisalabad district, Pakistan. They used Cobb-Douglas Production Function to calculate the impact of credit banks on the productivity of wheat and concluded that credit has a positive impact on productivity of wheat and hence it is an important tool for improving agricultural productivity.

**Abdullah et al. (2009)** stated in their study that easy and cheap credit is the quickest way for boosting agricultural production and use of modern agricultural technology, thus increases demand for credit and results in increase in agricultural yield of small farmers.

**Das et al. (2009)** revealed in their empirical analysis that, the agricultural credit has a positive and statistically significant effect on agricultural output. In their study they also showed that adequate supply of credit has a positive influence on the growth of agricultural output and farms incomes which had proved in case of many countries.

**Saboor et al. (2009)** Examined that credit plays an important role in increasing agricultural productivity. Timely and easy access to credit enables farmers (including small and marginal farmers) to purchase the required inputs and machinery for carrying out farm operations and increase farm production. The researchers also concluded that credit has ability to enhance the living standard of poor farmers and can help them come out of their poverty traps.

**Waheed (2009)** analyzed that to improve the well-being of rural poor farmers, micro finance is proposed to be primarily essential and commonly crucial for investment in rural productive activities. Their study concluded that per capita credit to non-poor was better than per capita credit to poor farmer.

**Bashir et al. (2010)** revealed that financial requirements of the farming sector have increased tremendously over the years due to the extended use of fertilizers, pesticides, improved seeds, mechanization etc. They observed that agricultural credit requirements have also increased over the time due to several problems including rising prices of main agricultural inputs, shortage of water and poor irrigation systems. The findings of their study showed that agricultural credit plays an important role in facilitating the transformation of agriculture and raising the participation of farmers in production process, that there is a positive correlation between credit supply and the augmentation of agriculture produce in the country. Hence, the institutional credit plays a significant role in the development of the agriculture sector and ultimately the development of the economy. They concluded that credit has a positive impact on the agricultural productivity that in term raises the living standards of the rural poor.

**Dong et.al. (2010)** observed that production inputs, farmers' capabilities and education cannot be fully employed under credit constrained situation. Based on a survey of 511 households from Heilongjiang Province of Northeast China and employing endogenous switching regression model, they concluded that agricultural productivity in the study area can be accelerated by 31.6 percent with the elimination

of credit constrained situation. The study further showed that productivity and income of the credit unconstrained farmers are higher than the credit-constrained farmers.

**Ayaz and Hussain (2011)** observed that credit availability to farmers is much more important than any other factors to enhance the resource use efficiency in agriculture sector. By employing Stochastic Frontier Production Analysis (SFA), they concluded that credit to agricultural sector has more constructive and significant impact on the farmers' technical efficiency than other factors like education, farming experience, herd size and number of cultivation practices.

**Bayes and Hossain (2011)** showed that the tenant farmers have restricted accessibility to formal credit sources due to various formalities and rigidities in terms and conditions. Their study also revealed that because of the collateral requirement of bank and other government institutions, small and landless farmers are deprived of credit.

**Rahman et al. (2011)** explored the lenders' performance and assessed the relationship between credit and farm production in Bangladesh. This study discovered a strong positive correlation between credit and production and the performance of lending institutions has been stepped forward through various coverage shifts and concerning non-public banks to agricultural credit operation. They found a high level of correlation (.938; with statistical significance 1 percent) between agricultural credit accessibility and greater agricultural production. In addition to this, food grain production, fisheries production have higher correlation (.948); whereas livestock products like milk, meat and eggs have been found to have a correlation of 0.772, 0.938, 0.688, respectively, all of which is statistically significant at 1 percent level.

**Saleem and Jan (2011)** evaluated the impact of agricultural credit on agricultural GDP in a specific district of Pakistan using a linear regression model based on Cobb-Douglass function. Their study concluded that the more supply of credit can enhance the agricultural production.

**Devi (2012)** observed that agricultural credit not only helped to increase the productivity but also develop the process of cultivation as a whole in Andhra Pradesh, India. She found that there was an enormous increase in the usage of modern seeds,

fertilizers and pesticides, modernized inputs after receiving the agricultural credit, which increased yield per acre and thus the income of the farmers.

**Duy (2012)** examined the impact of agricultural credit on farm productivity taking a sample of 654 farmers from Mekong Delta region of Pakistan by using quintile regression and Stochastic Frontier Analysis(SFA) techniques. In his study observed that technical efficiency and rice yield were positively influenced by access to credit, farm technology and education level. The researcher also demonstrates that access to formal credit sector had a larger effect on rice production than access to informal credit.

**Hussain and Thapa (2012)** conducted a study to evaluate smallholders' access to agricultural credit in Pakistan. They explored that the small-scale farmers are facing severe challenges, including several economic, technical, and social issues. In particular, the high needs for farm inputs and low access to institutional credit are primary economic problems. Results of their study revealed that the landholding size is a substantial factor in the sugarcane growers' access of formal agricultural credit.

**Akram et al. (2013)** observed that access to credit results in a higher level of technical efficiency of farmers. Their study was based on a sample survey of 152 farmers from Sargodha District of Punjab Province, Pakistan. Using stochastic frontier analysis (SFA), they concluded that agricultural credit in the study area helped the farmers reap the farm inputs in time, resulting in a higher level of technical efficiency.

**Ayegba and Ikani (2013)** revealed that unregulated private money lenders are still a major source of financing agricultural sector in Nigeria. They stated that the predominant barriers for agricultural credit from formal sector include high interest rates, bureaucratic bottlenecks, unnecessary request for collateral and late approval of loans among others. They recommended that banks and financial institutions should create credit instruments and offerings that are tailored to the risks and cash flow patterns in the agricultural sector. The banks need to open up new branches in rural areas and keep away from unnecessary credit conditionalities that discourage farmers from borrowing.

**Ibrahim and Bauer (2013)** analyzed the impact of micro credit on rural farmers' profit. The findings from the study confirmed the fact that farmers with access to credit are better off compared to those who do not have such access to credit. Their study recommended that by increasing the size of the loan, efficient and sustainable technology can be made available to farmers to increase farm productivity and profits.

**Alauddin and Biswas (2014)** discussed the impact of agricultural credit on growth, including trends, patterns, and problems using descriptive features and concluded with suggestions that agricultural credit can minimize the gap of agricultural credit disbursement and the actual demand of the needy farmers.

**Banking Development and Research Unit of Nepal Rastra Bank (2014)** conducted a case study regarding agricultural credit and its impact on farm productivity and explored the problems related to the procurement and use of agricultural credit by farmers of Kailali district in Nepal. Their study assessed impacts of such credit on farmers' technical efficiency and farm productivity. The findings of their survey indicated that agricultural credit helps to enhance the agricultural productivity of the farmers in the study area.

**Rahman et al. (2014)** investigated the impact of credit to farmers on agricultural productivity and emphasized agricultural credit as a major determinant of farm productivity. Their study utilized logistic regression method on the 300 samples from Bawalpur, Pakistan. With the positive association between credit and agricultural productivity they concluded that, timely provision of adequate amount of credit to farmers is helpful for the enhancement of agricultural productivity as it enables them to purchase high yielding variety seeds, fertilizers and pesticides.

**Rahman et al. (2014)** examined the impact of agricultural credit on rice production and food security of the farm households in Bangladesh and stated that, the primary means to ensure food security in Bangladesh is to develop the agriculture sector and rural economy to support and enhance the livelihoods of poor and vulnerable groups. The agriculture sector can play the most direct role through ensuring the availability of food and maintaining low prices domestically. Moreover, the development of the agriculture sector with its high multiplier effects can results in increased agricultural income which is a driver of rural growth and thus instrumental in improving access to food in rural areas. Multiple regression analyses were carried out by them using the

field survey data to determine the impact of credit on rice production and calorie intake in household and individual levels. It is revealed from their study that credit has a positive impact on the rice production. In addition, they found that, though the Bangladesh Krishi Bank has provided the loan for rice production, only 44.77 percent of the loan was used for rice production and 5.71 percent was used for food consumption. Furthermore, findings of their study revealed that credit has positive impact on caloric intake. Thus, they recommended that, to increase rice production and food security of rural poor households in Bangladesh, Government & non-government organizations, Bangladesh Bank, specialized Banks and other financial institutions should extend agricultural loans to meet the working capital needs of small and marginal farmers.

**Sharma (2014)** analyzed the impact of agricultural credit from commercial bank on GDP growth by using the time series data of Nepalese economy. He observed that agricultural credit has positively and significantly impacted agricultural GDP of Nepal. He recommended the extension and deepening of financial service system in the rural area and facilitating the agricultural lending.

**Narayanan (2015)** analyzed the relationship between agricultural credit supply and agricultural GDP in India by using state-level data for the period of 1995-96 to 2011-12. The findings of the study concluded that an increase in amount of agricultural credit supply is highly responsive to the increase in agriculture production.

**Sulemana et al. (2015)** conducted a study to evaluate the impact of microfinance on agricultural production in developing countries. Findings of their study established that microfinance is positively related to agricultural production and has a significant impact on output levels. In their study they observed that the major challenges with credit access include unavailability of collateral securities, small loan amounts and delay in the release of agricultural loans. They also observed that the principal challenge with credit administration is the lack of understanding of the loan acquisition process among farmers. In their study they recommended the formation of active farmer-based organizations, educating farmers on the loan acquisition process, encouraging farmers to save, and encouraging Microfinance Institutions (MFIs) and other development partners to adequately finance agriculture. They argued such

efforts have the potential to reduce income inequality thus contributing towards the achievement of the goal of poverty reduction as found by their paper.

**Yadav and Sharma (2015)** reviewed the agricultural credit situation in developing nations considering the 110 studies on this background. In their study they found that the small farmers are still in vulnerable situation due to limited access of institutional sources of credit and while in rural markets, the informal sources of credit are playing a dominating function.

**Akudugu (2012)** explored that formal agricultural credit enables rural households to confidently invest more in advanced technologies of agricultural production which help increase their production.

**Akudugu (2016)** argued in a study that credit is a financial help to the smallholder farmers to fulfill the cash requirement of main agricultural inputs used in production process.

**Ayeomoni and Aladejana (2016)** examined the affiliation between agricultural credit and economic growth in Nigeria using the ARDL approach for the period 1986 to 2014. Their study analysis and findings showed that, both the short run and the long run relationships exist between the agricultural credit and economic growth.

**Chandio et al. (2016)** evaluated the impact of formal credit on agricultural output in Pakistan. The empirical regression results of their study revealed that formal credit has positive and significant impact on agricultural output. Therefore, they concluded that credit will be helpful in raising farm productivity and as well as the standard of living of the small farmers. In their study they suggested that the procedure of credit should be made simple and flexible and government of Pakistan should support small farmers through credit schemes on affordable interest rate. They also suggested that financial institutions should launch crop insurance scheme in case of crop failure by flood, draught, pest attack, and heavy rains.

**Okosodo (2016)** analyzed the impact of agricultural credit on the economic development of Nigeria and suggested that reduced lending interest rate should be implemented for facilitating the agricultural sector.



**Saqib et al. (2016)** observed that access to formal credit in Pakistan is completely squeezed and inequitable. Large farmers enjoy more access and use to formal credit due to greater reliable collateral availability.

**Sarker, M. N. (2016)** studied to determine the role of banks in the agricultural development of Bangladesh and the findings of his study confirmed significant role of banks in agricultural development through agricultural credit disbursement.

**Chandio et al. (2017)** examined the smallholder farmers' access to agricultural credit in Sindh province of Pakistan using the probit model. Their study revealed that a number of socio-economic factors including household size, farming experience, off-income and availability of collateral significantly influenced on smallholder farmers' access to agricultural credit. They reported off-farm income and land availability as the foremost collateral determinants of access to credit.

**Iftikhan and Mahmood (2017)** pronounced that agriculture sector is the back bone of agrarian economies and it is the primary source of food and income in these economies like Pakistan. Their study findings revealed that food production in agricultural economy require bundle of resources but credit is one of the factor which help in risk aversion and risk Management. The one of the major problem faced by the farmers in conducting farming practices is the shortage of credit availability. In their study they also observed that institutional agricultural credit is significantly helping in combating food insecurity while non-institutional agricultural credit shows unexpected results. Therefore it was strongly recommended to provide institutional agricultural credit to reduce food insecurity issues in the country.

**Khatun et al. (2017)** observed that Agricultural Credit have a positive impact on household income and GDP growth rate. The findings of their study revealed that credit recipient farmers harvest spices with higher yield which finally helps in getting higher farm income.

**Chandio et al. (2018)** evaluated the impact of short-term loan (STL) and long-term loan (LTL) on wheat productivity of small farms in Sindh, Pakistan. The econometric estimation of their analysis reconfirmed that agricultural credit has a positive and highly significant effect on wheat productivity, while the short-term loan has a stronger effect on wheat productivity than the long-term loan. In their survey they

concluded that the reasons behind the phenomenon may be the significantly higher usage of agricultural inputs like seeds of improved variety and fertilizers which can be transformed into the wheat yield in the same year. However, the long-term loan (LTL) users have significantly higher investments in land preparation, irrigation and plant protection, which may lead to higher wheat production in the coming years.

**Khan (2018)** found that agriculture credit play key role in the development of agriculture. The researcher reported that, every country in the developing world has arranged financial institution for solution of credit problem in farm practices.

**Saqib et al. (2018)** observed in rural Pakistan, in particular, Sindh, that most of the farmers are resource-deficient and faced capital constraints with buying essential inputs. Therefore, in these circumstances they recommended that, agriculture credit is essential to cultivate the next crop.

**Islam (2020)** investigated the impact of agricultural credit on agricultural productivity in Bangladesh. Findings of his empirical analysis revealed that the short run and the long run relationships exist between the agricultural credit and agricultural productivity while the productivity of the agricultural sector also influenced by other dynamic variables like inflation, interest rate, and government expenditure on agriculture. He observed that providing agricultural credit to poor farmers (small, marginal and landless farmers) from formal credit sources can facilitate the timely and sufficient supply of agricultural inputs in order to promote the food production and improve the livelihoods of poor farmers. For a developing country like Bangladesh, ensuring food security through increased agricultural production is one of the important development goals. Thus, in his study he concluded that agricultural credit growth should increase to boost up the agricultural production, which would definitely be helpful in fostering economic growth in Bangladesh.

**BBS (2021)** reported that, Crop diversification programme, credit supply, extension work, research and input distribution policies pursued by the government are yielding positive results. The report indicated that Bangladesh is now on the threshold of attaining self-sufficiency in food grain production.

**Chandio et al. (2021)** conducted a study in Sindh province of Pakistan and concluded that, the credit access and use in the production process can enhance the crop

production and overall income of the farmers. Therefore, secure and timely availability of crop-specific credit can help the farmers to use inputs in a timely and recommended manner and enhance the crop productivity.

However, all these research works and reports that analyzed the agricultural credit and agricultural productivity relationship around the world proved the importance of agricultural credit on agricultural production, the findings of the current study are expected to be helpful for the farmers of Bangladesh in providing a basis for their production plans and decisions for onion cultivation. The result of the study will help the policy makers in understanding socio-economic characteristics of the onion cultivators and determining the factors that influence farmer's choice of using and access to specialized agricultural credit for onion cultivation. The study may also be helpful to the policy makers to learn about various aspects related to spices credit and to evaluate the utilization pattern, impact of specialized agricultural credit (SAC). Thus, the study may help the policy makers in performing further improvement of the special credit program on similar crops productions in the context of Bangladesh.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 Introduction**

Methodology is the rational as well as organized part of the study to guide scientific exploration. Dictionary of social science defined, methodology as “the systematic and logical study of the principals guiding scientific investigation”.

Methodology explains the entire process that is followed for the completion of the research work successfully. The methodology section answers two main questions: How was the data collected or generated? How was it analyzed? It comprises the theoretical analysis of the body of methods and principles associated to address the study objectives with a scientific manner. For good accomplishment of the research work a well-arranged methodology is extremely needed and all the work should be done in a sequence. A proper methodology should be formulated for this.

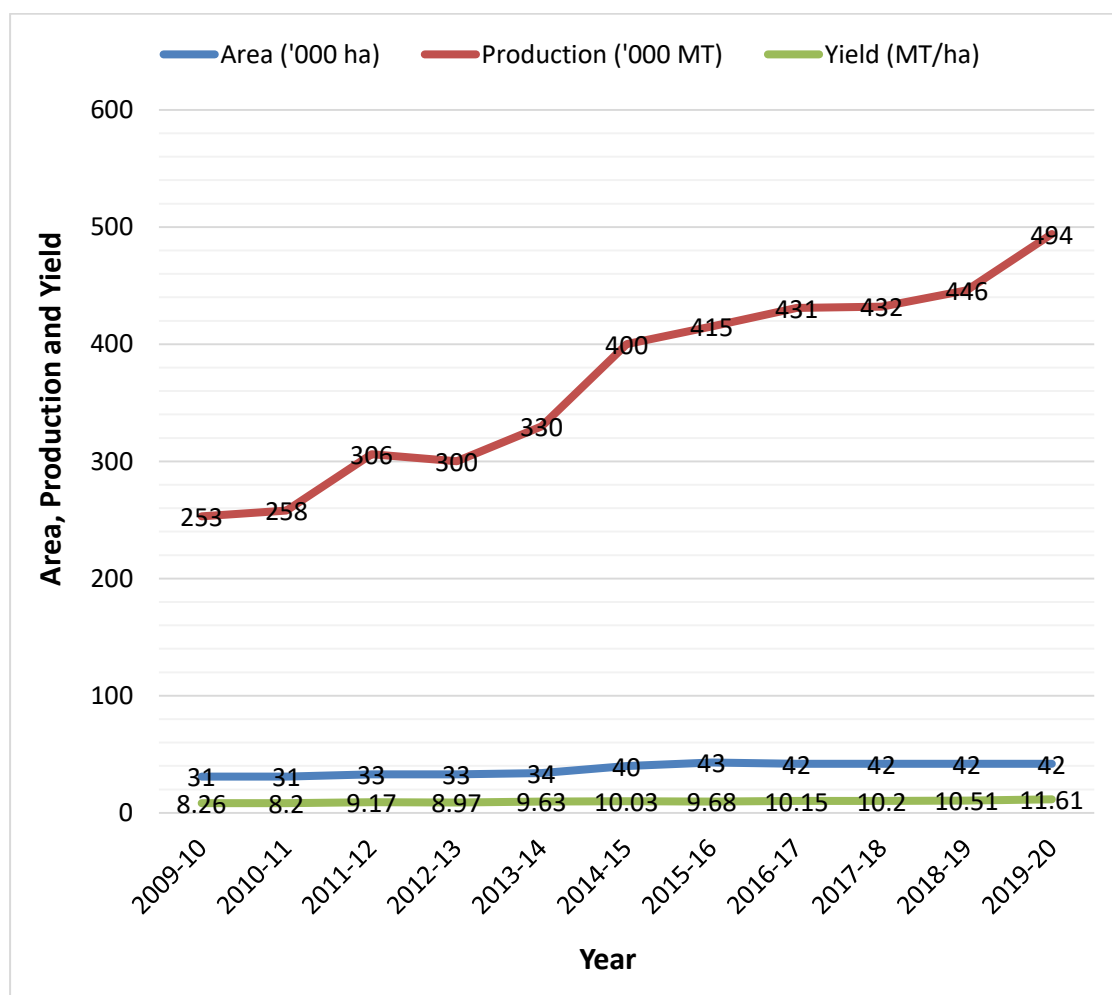
A farm business research normally entails gathering information from individual farmers; data collection for farm business analysis necessitates the analyst's judgment in selecting data collecting techniques within the constraints imposed by the work's resources (Dillon and Hardaker, 1993). A sequential description of the methodologies that was followed in conducting the present study has been presented in this chapter under the following headings.

#### **3.2 Selection of the Study Area**

The study has been carried out in some selected villages of Sujanagar and Santhia upazila under Pabna district based on the availability of specialized agricultural credit users, as Sujanagar is the highest onion producing upazila in the country followed by Santhia. Onion cultivators at Pabna’s Sujanagar, Santhia and Bera upazila are known as ‘the reserves of onions’.

In the fiscal year 2019-20, Pabna was the highest onion producing district (4,94,163 MT) in Bangladesh followed by Faridpur (2,65,150 MT) and Rajbari (2,51,861 MT).

Yield of onion cultivation is also increasing year after year in Pabna district (Figure-3.1) (BBS,2021).



Source: BBS, 2021

**Figure 3.1: Area, Production and Yield of Onion in Pabna District, 2009-2010 to 2019-2020**

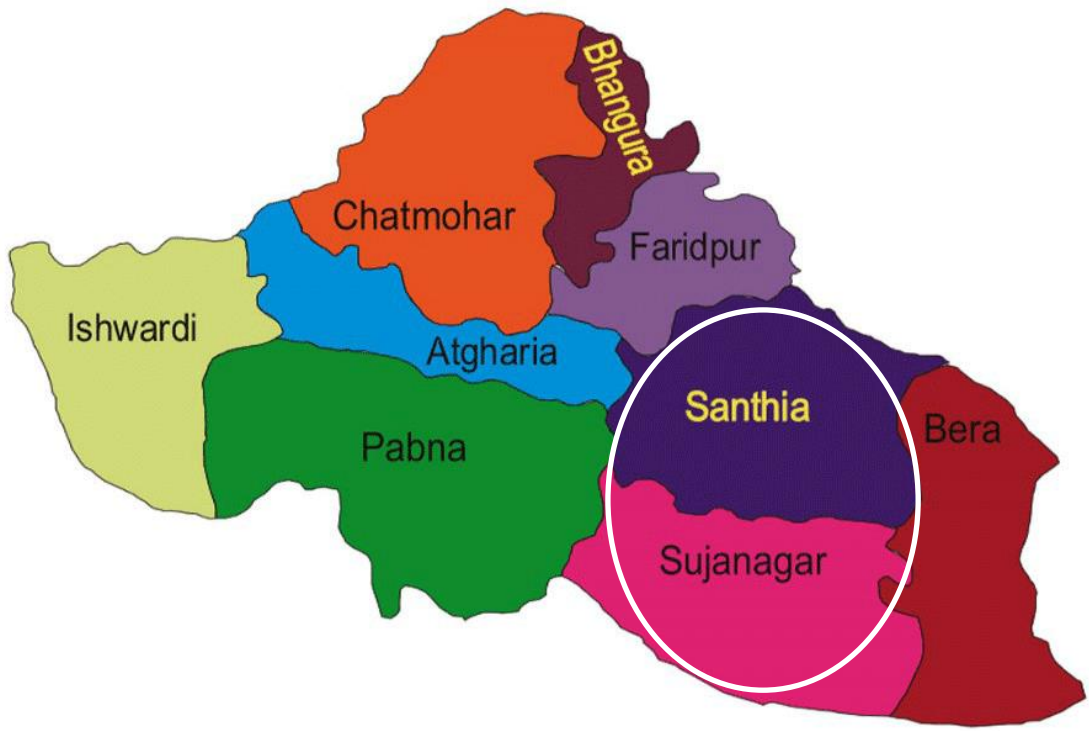
Although onion is cultivated across Bangladesh, the region chosen suited both the study's specific objective and the possibility of cooperating with the farmer. As the research region contained a big number of onion farmers, a high degree of participation from respondents was anticipated in order to get trustworthy data.

The upazila is the second lowest tier of administrative government in Bangladesh. The districts of Bangladesh are divided into sub-districts called upazila (Sarker, 2010). Pabna district has 09 upazilas, among them 08 villages of Sujanagar upazila (Bonkola, Daspara, Duria, khoyran, Manikhat, Shripur, Sayedpur, Ulat) and 04 villages of Santhia upazila (Gupinathpur, Kallanpur, lalipara, Shaheednagar) have been selected. A map of Bangladesh showing Pabna district and a map of Pabna district showing the study area have been presented in Figure-3.2 and Figure-3.3, respectively.



Source: [www.google.com](http://www.google.com)

**Figure 3.2: Map of Bangladesh Showing Pabna District**



Source: [www.google.com](http://www.google.com)

**Figure 3.3: Map of Pabna District Showing the Study Area: Sujanagar and Santhia Upazila**



### **3.3 Sampling Technique**

The study has been conducted by following a simple random sampling technique because of the underlying advantages of the technique as it improves the accuracy of survey results and lowers the cost of survey without losing accuracy.

To fulfill the study objectives, we have conducted a field survey in the study area to collect information about onion production and agriculture credit use. One of the most important problems in planning a sample survey is that of determining how large a sample is needed for the estimates to be reliable enough to meet the survey objectives. Too large a sample involves huge cost, manpower, materials and time, while too small a sample size invalidates the results of the study. However, around 30 cases seem to be the bare minimum for studies in which statistical data analysis is to be done (Islam, 2011).

In this study, considering the time and resource constraints, we have taken 40 respondents as a sample size for each category (credit recipient and non-recipient). At first list of credit receivers is collected from the local branch of the Rajshahi Krishi Unnayan Bank. From that list a total of 40 credit receivers are selected randomly. Besides, 40 non-receivers are also selected randomly from the selected study areas. Thus, a total of 80 respondents have been selected to achieve the objectives.

### **3.4 Data Collection**

Data collecting is viewed as an important aspect of a survey since it has a substantial influence on the quality of the findings. Given its significance, the following precautions were taken throughout the development of the questionnaire as a data gathering tool:

#### **3.4.1 Questionnaire Design**

A questionnaire is a strong data collecting instrument that uses multi-dimensional questions to acquire information. Generally, the aim is to obtain information suitable for the statistical analysis. A questionnaire without a defined objective and purpose would always ignore crucial topics and waste the time of enumerators and respondents by asking and responding to irrelevant questions. All of these issues were considered to the best of our ability in order to construct the survey questionnaire.

### **3.4.2 Pre-testing the Questionnaire**

The questionnaire is pre-tested to determine the amount of time required to complete the interview, its reliability (i.e., if it caught the information sought), and its consistency (i.e., whether the information acquired was relevant to the survey's overall goal). The test also aimed to assess the logistics necessary for the survey's effective operation. Pre-testing has been conducted in the village named Bonkola of Sujanagar upazila under Pabna district between 24 August to 26 August 2020 to assure the optimal performance of the questionnaire in terms of data collecting, processing, and analyzing.

### **3.4.3 Finalization of the Questionnaire**

The questionnaire has been sent to my supervisor after I addressed all of the adjustments based on the pre-test suggestions. My supervisor also made a significant correction to the survey questionnaire. With the permission, the questionnaire is finally completed.

### **3.4.4 Method of Data Collection**

Primary data has been collected from the selected respondents through face to face interview method by using pre-designed questionnaire with the assistance of agricultural extension officers, local representatives and Rajshahi Krishi Unnayan Bank (RAKUB) officials of the selected study areas during the month of November 2020 to January 2021. A total of 80 respondents, 55 onion cultivators from 08 villages of Sujanagar upazila and 25 onion cultivators from 04 villages of Santhia upazila under Pabna district have been interviewed for data collection.

Data collected on onion cultivators include demographic characteristics such as age, education and family size, social variables such as farming experience, economic variables such as farm size, and contextual variable such as credit availability. Moreover, regarding the cost of farming inputs, the cost of seed used, fertilizer cost, pesticide cost, labor cost, land preparation cost and irrigation cost were also collected from onion cultivators.

### **3.4.5 Data Editing, Coding and Processing**

The process of verifying and cleansing data that has previously been collected from the field is referred to as data editing. After consulting with the study supervisor, the

information gathered has been manually modified and coded. After then, all of the data is compiled and thoroughly examined. It should be remembered that the information has been first gathered in local units and converted to regular international units after requisite checks.

Editing and coding of collected data are critical aspects of the survey, both of which are required for data processing and prior to data processing it should be finished. Data processing includes data input (using the Microsoft Excel application), appending and merging files, data validation (additional computer checking and editing), final judgment on mistakes, completion of data processing and production of data files, final documentations and storage of all files.

### 3.5 Analytical Techniques

Both descriptive and econometric analysis has been used for analyzing the data. Some descriptive statistics have been used to obtain the first objective. To achieve the second objective binary discrete choice model is used. For third objective, mostly descriptive statistics and for fourth objective, Cobb-Douglas production function analysis is conducted.

The analyses have been performed on a computer using the applications Microsoft Excel and STATA. Tables and figures were employed to show facts.

**The first objective** of the thesis is “To assess the socio-economic profile of the onion cultivators”. Some descriptive statistics (average, percentage) have been used to assess the socio-economic profile of the farmers.

**The second objective** of the thesis is “To identify the factors affecting access to specialized agricultural credit”. To address the second objective a logistic regression model has been used. The specification of the model is as follows;

$$Z_i^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + u \dots\dots\dots (1)$$

$Z_i$  = binary variable= { 1 if farmer receive specialized agricultural credit,  
0 otherwise }

Where,

$Z_i^*$  is the latent dependent variable for receiving specialized agricultural credit, which is observed through the probability to get specialized agricultural credit with  $Z_i$ .

For instance the logit model follows:

$$Z_i^* = \text{Log} [P/1-P], \quad \text{where } P = P (Z_i=1) \text{ and } (1-P) = P (Z_i=0)$$

$\beta_0$  = Intercept

$\beta_1 - \beta_6$  = Co-efficient of related variables

$X_1$  = Age of the household head measured in completed years

$X_2$  = Dummy for education level = (1 if the household head is literate;  
0 otherwise)

$X_3$  = Family size (number of family members)

$X_4$  = Farm size = Size of the land being cultivated for onion production (ha)

$X_5$  = Natural log of farmer's income from onion cultivation

$X_6$  = Dummy for non-farm income = (1 if the household head have non-farm income;  
0 otherwise)

$u$  = Random error

**The third objective** of the thesis is “To explore the utilization pattern of specialized agricultural credit for onion cultivation”. To achieve the third objective, descriptive statistics such as averages and percentages have been used in this study.

**The fourth objective** of the thesis is “To evaluate the impact of specialized agricultural credit on onion production”. To explore the fourth objective, Following Bashir et al. (2010); Ahmed et al. (2014); Chandio et al. (2021); Javed et al. (2006); and Nazir et al. (2013), the Cobb-Douglas type production function has been used. Cobb-Douglas form of the production function is selected to assess the contribution of

agricultural credit to onion production since it can handle multiple inputs in its generalized form (Bashir et al.,2010).

Formally, the production function can be written as:

$$\ln Y = \ln A + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 X_6 + u \dots\dots\dots(2)$$

Where,

$Y$  = Onion yield (mounds/ha)

$X_1$  = Seed cost (Tk./ha)

$X_2$  = Fertilizer cost (Tk./ha)

$X_3$  = Labor cost (Tk./ha)

$X_4$  = Land preparation cost (Tk./ha)

$X_5$  = Irrigation cost (Tk./ha)

$X_6$  = Specialized Agricultural Credit use = Dummy for credit use (1 if credit is used;  
0 otherwise)

$B_1 - B_6$  = Co-efficient of related variables

$u$  = Stochastic random error term

The inclusion of specialized agricultural credit use as an independent variable in above equation can be criticized because of the fact that credit does not affect the output directly. But it is evident from the previous studies that credit has an indirect effect on output through lessening the financial constraints of the farmers (Bashir et al., 2010). According to Elahi and Rahman (1995) credit is not a direct input in production, rather credit affects production through influencing the demand and supply for inputs used in the production process.

Specialized agricultural credit use is included in the above equation due to the fact that it can move farmers along the production surface more efficiently: firstly,

availability of adequate credit influence the efficient distribution of resources by overcoming constraints to purchase inputs and use them optimally which shifts the farmer along a given production surface to a more intensive input use; secondly, credit may help to purchase a new technological package (including high yielding hybrid seeds, advanced irrigation system etc.) that will shift the production surface; and thirdly it may help to use more intensively the use of fixed inputs (Carter, 1989).

### **Explanation of the Variables Used in Equation-(2)**

#### **Seed cost ( $X_1$ )**

Seed is the most vital and crucial input for crop production. Cultivation of crop using quality seed is one of the most effective ways to increase crop productivity. Quality seeds, therefore, is the basic critical input upon which all other inputs will depend for their effectiveness. The input like fertilizers, irrigation, labor etc. and suitable agronomic practices contribute greatly towards enhancing yield and quality of the produce. But, if good quality seed is not used, the full benefit of such inputs and agronomic practices cannot be realized. Therefore, the quality of seed plays a decisive role in influencing the cultivators' profitability.

Farmers of the study area use three category of seed for onion cultivation: Local variety (Taherpuri, Faridpuri etc.), Cross-king and HYV (BARI Onion-4). Seed cost variable is measured in Tk./ha.

#### **Fertilizer cost ( $X_2$ )**

Fertilizers provide crops with nutrients (like potassium, phosphorus, nitrogen) that promote plant growth and maximize crops yield up to a certain level. Farmers of the study area generally use Urea, TSP, MoP and Gypsum for onion cultivation. In this study, fertilizer cost variable includes cost of using these chemical fertilizers in onion production. The variable is measured in Tk./ha.

#### **Labor cost ( $X_3$ )**

Onion cultivation is more labor intensive than many other crops cultivation. Here, cost of hired labor involved in onion cultivation is considered for the calculation. Labor cost includes cost of labor from sowing of onion seeds to transplanting of the

seedlings in main field and harvesting of the onion. Labor cost variable is measured in Tk./ha.

#### **Land preparation cost ( $X_4$ )**

Land preparation cost includes cost of ploughing, laddering and irrigation during preparation of the land for seed sowing and for transplanting of the seedlings. Land preparation cost variable is measured in Tk./ha.

#### **Irrigation cost ( $X_5$ )**

Irrigation is a critical component in onion cultivation. Depending upon the soil condition and season, optimum level of irrigation is required. If the onion does not get enough water it will not make a large bulb. Farmers of the study area reported that they maintain high precautions regarding irrigation especially after seed sowing and immediately after transplanting of the seedlings in main field. Because of the shallow root system onions require frequent furrow irrigation.

Irrigation cost variable includes cost of irrigation after seed sowing (10-12 times) and after transplanting of the seedlings in main field (4-5 times). The variable is measured in Tk./ha.

#### **Specialized Agricultural Credit use( $X_6$ )**

The variable is measured on the basis of whether the farmers use or don't use specialized agricultural credit (SAC) in onion production.

The farmers who use specialized agricultural credit is given a score of 1 and the farmers who don't use Specialized agricultural credit is given a score of 0. Thus, the range of specialized agricultural credit use score is 0 to 1.

## **CHAPTER 4**

### **SOCIO-ECONOMIC PROFILE OF THE ONION CULTIVATORS**

The first objective of the thesis is “To assess the socio-economic profile of the onion cultivators”. In this chapter, findings of the data analysis explaining the first objective of the study are discussed.

It is important to assess the socio-economic profile of the farmers to ensure widespread and efficient disbursement of specialized agricultural credit (SAC) facility. This chapter will help in understanding socio-economic characteristics of the onion cultivators. Thus, findings of this chapter are expected to be helpful to the policy makers to implement the SAC program in a feasible and effective manner and to conduct further improvement of the programme. The findings of this chapter may also be helpful to the field workers, extension service workers and bank officials to develop appropriate strategies for effective working with the rural farmers.

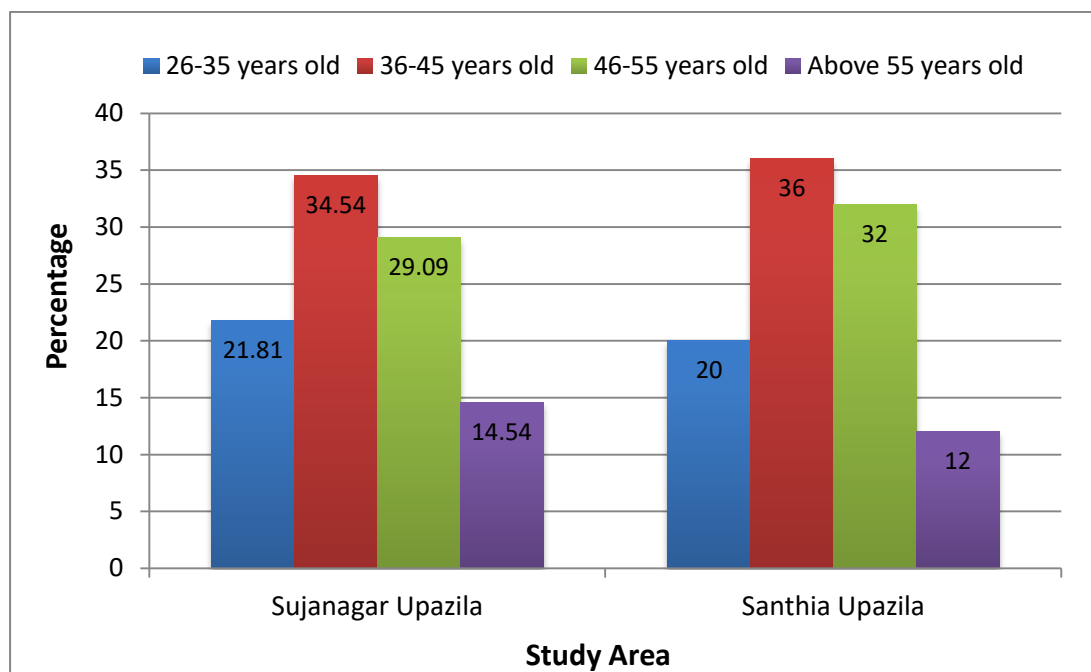
Some descriptive statistics have been used to assess the socio-economic profile of the farmers. The findings of the data analysis and interpretation of the results are conveniently presented in this chapter as follows:

#### **4.1 Age**

Age of the respondent (household head) is defined as the period of time in actual years from his birth up to the time of interviewing and measured in completed years. A score of one (1) is assigned for each year of age which is found on the basis of the verbal response of the onion cultivating farmers. 80 samples have been taken from two upazilas of Pabna district called Sujanagar and Santhia, respectively, to reflect the whole population. In Sujanagar upazila, 21.81 percent of sample populations were 26-35 years old, 34.54 percent were 36-45 years old, 29.09 percent were 46-55 years old and 14.54 percent were over 55 years old. In Santhia upazila, 20 percent of sample populations were 26-35 years old, 36 percent were 36-45 years old, 32 percent were 46-55 years old and 12 percent were over 55 years old. And overall, around 21 percent of the sample farmers were 26-35 years old, 35 percent were 36-45



years old 30 percent were 46-55 years old and 14 percent were over 55 years old in the research region. So, in each upazila the majority of individuals were between the ages of 36 and 45 years old (Figure 4.1).

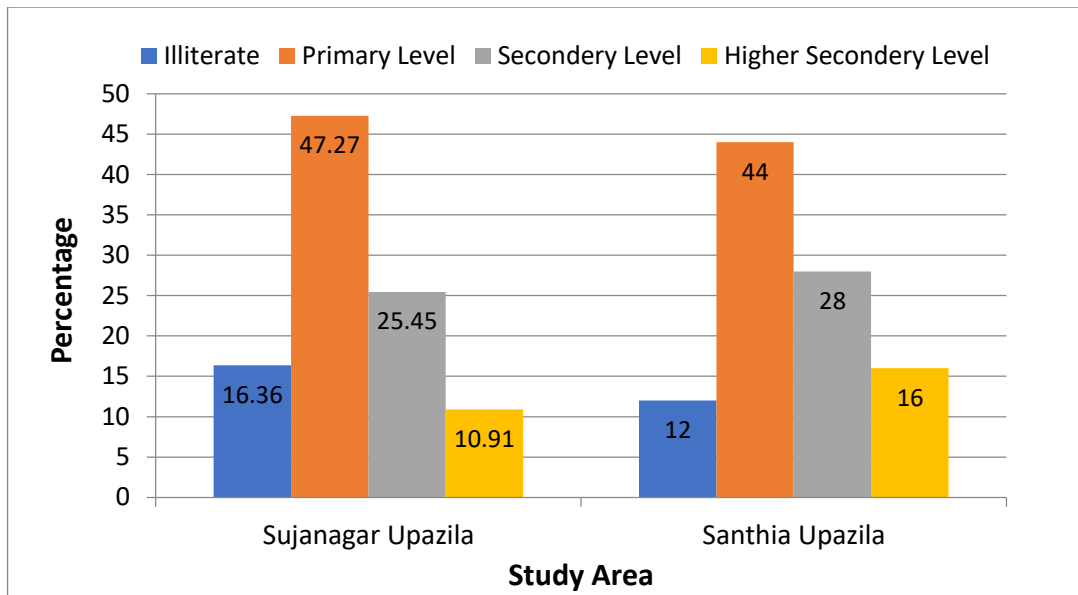


Source: Field Survey, 2021

**Figure 4.1: Age of the respondents by Study Area (Percentage)**

## 4.2 Education

According to Figure 4.2, 16.36 percent of farmers have no education/illiterate, around 47 percent of individuals have a primary level of education, 25.45 percent have a secondary level of education, and approximately 11 percent have a higher secondary level of education in Sujanagar upazila. In Santhia upazila, 12 percent of farmers have no education/illiterate, 44 percent of individuals have a primary level of education, 28 percent have a secondary level of education, and 16 percent have a higher secondary level of education. And overall, we can see from this number that 15 percent of farmers have no education/illiterate, around 46 percent have a primary level of education, 26 percent have a secondary level of education and approximately 13 percent have a higher secondary level of education in the study area. So, the majority of individuals in each upazila have a primary level of education.

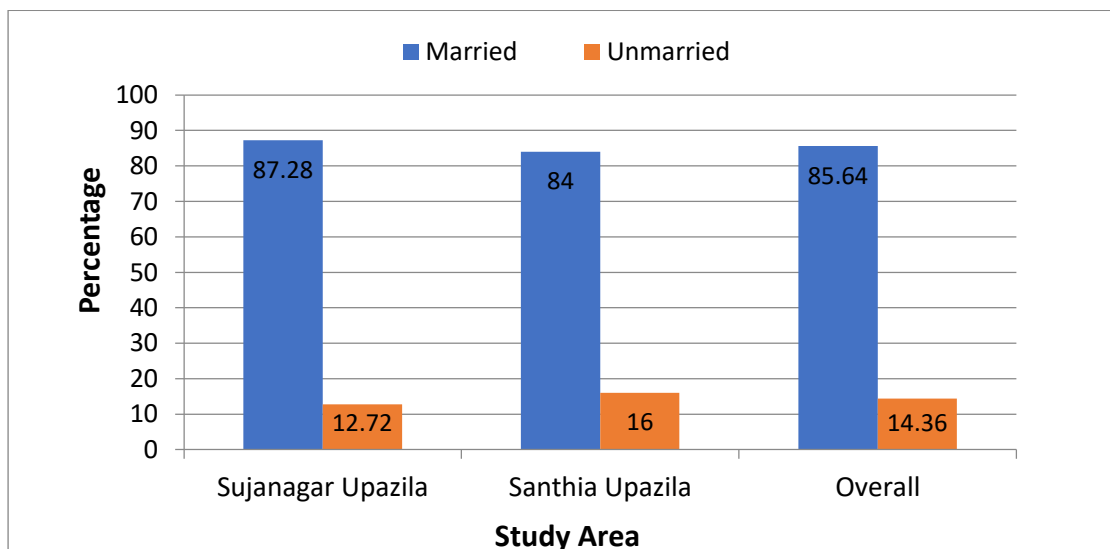


Source: Field Survey, 2021

**Figure 4.2: Education Level of the Farmers by Study Area (Percentage)**

### 4.3 Marital Status

According to Figure 4.2, around 87 percent of the sample populations are married and 13 percent are unmarried in Sujanagar upazila. In Santhia upazila, 84 percent of the sample populations are married and 16 percent are unmarried. And altogether, around 86 percent respondents in the study area are married and 14 percent are unmarried.



Source: Field Survey, 2021

**Figure 4.3: Marital Status of the Farmers by Study Area (Percentage)**

#### 4.4 Composition of the Family Size

Family size refers to the number of family members including the respondent himself, his wife, children, unmarried young girl, father, mother, sister, and various more relatives who live and live together in a family unit. Family size is crucial in terms of supplying appropriate nutritional grain, treatment for medical emergency, education opportunity etc. for the ranch family. In this study, family is defined as the total number of individuals living in a similar kitchen and eating meals under the influence of a single family leader. According to Table 4.1, the average family size in Sujanagar upazila is 5.65 while in Santhia upazila it is 5.20. And the average family size in the study region is 5.42, whereas the average family size in the nation is 4.06 (Table 4.1).

**Table 4.1: Average Family Size and Distribution of Members According to Sex of the Sample Farmers in the Study Area**

Particulars	Sujanagar Upazila		Santhia Upazila		All Farmers		National Average Family Size
	Number	Percent	Number	Percent	Number	Percent	
<b>Male</b>	3.23	57.17	3.05	58.65	3.14	57.93	
<b>Female</b>	2.42	42.83	2.15	41.35	2.28	42.07	4.06
<b>Total</b>	5.65	100.00	5.20	100.00	5.42	100.00	

Source: Field Survey, 2021

#### 4.5 Farm Size

Farm size of a farmer referred to the total area of land on which his family carried out the farming operation, the area being in terms of full benefit to the family. Based on their total farm size, the farmers were classified into three categories as follows:

**Table 4.2: Classification of the Farmers According to Farm Size**

Category	Area (Hectare)
Small Farmer	0.02 to 1.00
Medium Farmer	1.01 to 3.03
Large Farmer	3.04 to above

Source: BBS, 2021

From Table 4.2 it can be seen that, 30.91 percent are small farmer, 54.55 percent are medium farmer and 14.54 percent are large farmer in Sujanagar upazila. While 24 percent are small farmer, 60 percent are medium farmer and 16 percent are large farmer in Santhia upazila. And overall 28.75 percent are small farmer, 56.25 percent are medium farmer and 15 percent are large farmer in the study area (Table 4.3). So, the majority of respondent farmers (73.75 percent) fall in the category of medium farmer in the study area.

**Table 4.3: Categorization of the Sample Farmers According to Farm Size**

Farm Size	Sujanagar Upazila		Santhia Upazila		Overall	
	Number	Percent	Number	Percent	Number	Percent
<b>Small</b>	17	30.91	6	24	23	28.75
<b>Medium</b>	30	54.55	15	60	45	56.25
<b>Large</b>	8	14.54	4	16	12	15
<b>Total</b>	55	100.00	25	100.00	80	100.00

Source: Field Survey, 2021

#### 4.6 Annual Farming Income

In the study area, majority of the sample framers earn their living through agricultural activities. Crop cultivation is the primary source of income for those individuals, with an average annual revenue from farming of Tk. 67,500 (Table 4.4).

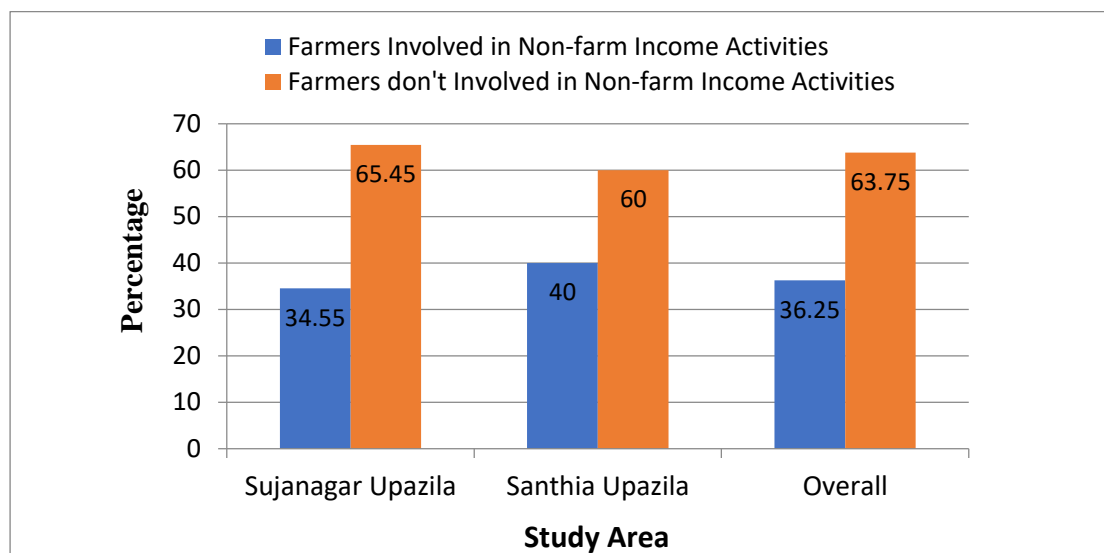
**Table 4.4: Average Annual Farming Income of the Sample Farmers in the Study Area**

Particulars	Average Annual Farming Income (Tk.)	Overall
Sujanagar Upazila	89,000	Tk. 86,750
Santhia Upazila	84,500	

Source: Field Survey, 2021

#### 4.7 Farmers Involvement in Non-farm Income Activities

Non-farm income activities include day labor, auto and truck driving, small business, overseas remittance, and services. From Figure-4.4 it can be seen that, in Sujanagar upazila, 34.55 percent of the sample farmers involved in non-farm income activities and 65.45 percent farmers don't have non-farm income sources. While in Santhia upazila, 40 percent farmers involved in non-farm income activities and 60 percent farmers don't have non-farm sources income. Overall, 36.25 percent of the sample farmers involved in non-farm income activities and 63.75 percent farmers don't have non-farm income sources. So, the majority of sample populations (around 64 percent) depend only on farming activities for their living in the study area.



Source: Field Survey, 2021

**Figure 4.4: Farmers Involvement in Non-farm Income Activities by Study Area (Percentage)**

## **CHAPTER 5**

### **FACTORS AFFECTING ACCESS TO SPECIALIZED AGRICULTURAL CREDIT**

The second objective of the thesis is “To identify the factors affecting access to specialized agricultural credit”. In this chapter, findings of the data analysis explaining the second objective of the study are discussed.

A realistic understanding of the determinants of access to SAC is crucial to develop appropriate disbursement strategies for widespread implementation of the SAC programme. The results discussed in this chapter are expected to assist Bangladesh Bank and the policy makers in determining the factors that influence farmer’s access to specialized agricultural credit for onion cultivation.

To address the second objective of the study, the findings of the data analysis and interpretation of the results are presented in this chapter as follows:

#### **5.1 Determinants of Access to Specialized Agricultural Credit**

To identify the factors affecting access to specialized agricultural credit, the logistic regression model analysis has been conducted. For this, equation-(1) from the chapter-3 (Methodology) is used. To check validity of the fitted model, the following tests have been conducted.

At first, heteroscedasticity test is conducted. Where chi-square value is 0.00 and probability is 97 percent which is insignificant. That means heteroscedasticity problem is absent in the model.

Secondly, correlation matrix is generated to check collinearity issues among the variables. It can be seen from the correlation matrix that the value of each correlation is below 70 percent. Where, maximum correlation is 37 percent which is under acceptable condition (Table-5.1). For instance, correlation between education and family size is 8.95 percent, correlation between family size and farming income is 37.25 percent, correlation between farm size and farming income is 24.60 percent,

correlation between education and non-farm income is -5.12 percent, and so on (Table-5.1). So, we don't have any severe collinearity issue in our model.

**Table 5.1: Correlation Matrix of the Variables Used in Equation-(1)**

<b>Variables</b>	Age	Education	Family size	Farm size	Farm income	Non-farm income
Age	1.0000					
Education	-0.5232	1.0000				
Family size	-0.0203	0.0895	1.0000			
Farm size	0.0125	0.0669	0.1874	1.0000		
Farming income	-0.3202	0.2657	0.3725	0.2460	1.0000	
Non-farm income	0.1765	-0.0512	-0.0457	0.0545	-0.1215	1.0000

Source: Field Survey, 2021

Besides, we test the VIF which shows that the overall VIF is 1.27 ranging from 1.05 to 1.52 which is less than 10 (Table-5.2). For instance, it can be seen from Table-5.2 that, VIF of variable age is 1.52, VIF of education is 1.41, VIF of non-farm income is 1.05, and so on. So, we don't have any serious multicollinearity issue in our analysis.

**Table 5.2: VIF Test Results of the Equation-(1)**

<b>Variable</b>	<b>VIF</b>	<b>1/VIF</b>
Age	1.52	0.658356
Education	1.41	0.709661
Family size	1.39	0.720324
Farm size	1.19	0.840117
Farming income	1.09	0.914087
Non-farm income	1.05	0.955286
<b>Mean VIF</b>	<b>1.27</b>	

Source: Field Survey, 2021

Therefore, we estimated the logit model using equation-(1) and the estimated results are given below:

**Table 5.3: Factors Affecting Access to Specialized Agricultural Credit (SAC)**

Variable name	Logit coefficient	Standard error	Marginal effect	Standard error
Age	-0.297***	0.088	-0.015***	0.002
Education	5.228*	2.873	0.264*	0.136
Family size	2.070***	0.778	0.104***	0.030
Farm size	5.163*	2.757	0.260**	0.121
Farming income	2.875**	1.307	0.145**	0.056
Non-farm income	1.683	1.235	0.085	0.059

Source: Field Survey, 2021

**Note:** Dependent variable: Access to Specialized Agricultural Credit = { 1 if farmer receive specialized agricultural credit; 0 otherwise }

‘\*’, ‘\*\*’, ‘\*\*\*’ denote significant at 10%, 5% and 1% level respectively.

**Age:** From Table-5.3 it can be seen that the coefficient of age variable is negative and significant at 1 percent level. Therefore, if farmers’ age increases by 1 percent then farmers’ probability to receive SAC will be decreased by 1.5 percent, which implies that aged farmers are risk-averse and reluctant to access credit.

**Education:** It can be seen from Table-5.3 that the education variable is significant at 10 percent level. That means literate farmers are 26.4 percent more likely to receive specialized agricultural credit (SAC) compared to the illiterate farmers.

**Family size:** It can be seen from Table-5.3 that the family size variable is significant at 1 percent level. Therefore, if family size increases by 1 percent then farmers’ probability to receive SAC will be increased by 10.4 percent.

**Farm size:** From Table-5.3 it can be seen that the farm size variable is significant at 5 percent level. Therefore, if farm size increases by 1 percent then farmers’ probability to receive SAC will be increased by 26 percent.

**Farming income:** From Table-5.3 it can be seen that, the farming income variable is significant at 5 percent level. That means if farming income increases by 1 percent then farmers’ probability to get SAC will be increased by 14.5 percent.



**Non-farm income:** It can be seen from Table-5.3 that, the sign of non-farm income variable is positive which is in line with our expectation but the coefficient is insignificant.

## 5.2 Credit Non-recipient Farmers' Perception on Reasons of not Getting Specialized Agricultural Credit (SAC)

Credit non-recipient farmers mentioned various reasons of not getting specialized agricultural credit (Table-5.4). Majority of the sample farmers (77.5 percent) mentioned lack of information and knowledge about specialized agricultural credit as the main reason behind not receiving credit facility. 40 percent of the non-recipient farmers mentioned lack of communication with UAO and the bank as a reason of not getting SAC. About 38 percent of the farmers cited lack of understanding of the credit acquisition process as a reason for not getting SAC. Of the total credit non-recipient farmers, 20 percent reported small loan amounts compared to the actual demand as a reason for not getting SAC. The other reasons mentioned by the non-recipient farmers were they didn't have ability to keep collateral in bank (10 percent), didn't have any need to take credit (10 percent), didn't want to pay interest (2.5 percent) (Table-5.4).

**Table 5.4: Non-recipient Farmers' Perceptions on Reasons of not Getting SAC**

Sl. No.	Reasons	Number of Farmers who reported	Percentage of farmers
1.	Lack of information and knowledge about specialized agricultural credit (SAC)	31	77.5
2.	Don't have communication with UAO and the bank	16	40.0
3.	Lack of understanding of the credit acquisition process	15	37.5
4.	Amount of credit is not sufficient	8	20.0
5.	Have no ability to keep collateral in bank	4	10.0
6.	No need to take credit	4	10.0
7.	Didn't want to pay interest	1	2.5

Source: Field Survey, 2021

## **CHAPTER 6**

### **UTILIZATION PATTERN OF SPECIALIZED AGRICULTURAL CREDIT FOR ONION CULTIVATION**

The third objective of the thesis is “To explore the utilization pattern of specialized agricultural credit for onion cultivation”. In this chapter, findings of the data analysis explaining the third objective of the study are discussed.

The results discussed in this chapter are expected to be helpful for the farmers in providing a basis for their production plans and decisions in onion cultivation. The choice of seeds, fertilizers, machineries etc. is very crucial for agricultural production, of which farmers may have little knowledge by themselves. Thus, Farmers should be provided technical know-how about how to utilize credit for the enhancement of farm productivity by using better inputs and better farming practices. For this, it is essential to have a realistic understanding of the SAC utilization pattern for onion cultivation. The results discussed in this chapter are expected to assist policy makers in recommending and providing benefits for farmers to utilize specialized agricultural credit efficiently in onion cultivation.

Some descriptive statistics have been used to explore the utilization pattern of specialized agricultural credit for onion cultivation. The findings of the data analysis are conveniently presented in this chapter as follows:

#### **6.1 Amount of Specialized Agricultural Credit Received by the Farmers**

The average amount of credit received by the farmers was Tk. 82,123.62. Highest percentage of farmers (27.5 percent) received credit within the range of Tk. 1,00,000 to Tk. 1,19,000 and their average received money was Tk. 1,01,363 (Table-6.1).

**Table 6.1: Amount of Credit Received by the Farmers**

Range of credit received (Tk.)	Average amount (Tk.)	No. of recipient farmers	Percentage of recipient farmers
20,000-39,000	25,000	3	7.5
40,000-59,000	60,989	5	12.5
60,000-79,000	66,250	8	20.0
80,000-99,000	85,500	10	25.0
1,00,000-1,19,000	1,01,363	11	27.5
1,20,000-1,49,000	1,27,500	2	5.0
1,50,000-2,00,000	1,50,000	1	2.5
<b>Total</b>	<b>82,123.625</b>	<b>40</b>	<b>100</b>

Source: Field Survey, 2021

**6.2 Types of Collateral Ensured by the Credit Recipient Farmers in Bank**

It is observed that, 92.5 percent of farmers provided the document or record of their own land and 7.5 percent of farmers provided the rented in land record as collateral to get specialized agricultural credit (Table-6.2).

**Table 6.2: Types of Collateral Keeping in Bank by the Farmers**

Types of collateral	No. of recipient farmers	Percentage of recipient farmers
Own land record	37	92.5
Rented in land record	3	7.5
<b>Grand total</b>	<b>40</b>	<b>100</b>

Source: Field Survey, 2021

**6.3 Cost Associated with the Process of Getting Specialized Agricultural Credit**

Along with the 4 percent interest on credit amount, credit recipient farmers paid some extra amount of money in the process of receiving specialized agricultural credit (Table-6.3).

**Table 6.3: Cost Associated with the Process of Getting SAC**

Cost items	Amount
VAT	Tk. 5 / Tk. 1000 of credit
Tax	15 percent of VAT
Revenue stamp	Tk. 60

Source: Field Survey, 2021

#### 6.4 Farmer's Acceptance of Extra Cost for Getting Specialized Agricultural Credit

Every credit service has some amount of necessary charges. The farmers of the study areas also spent some money for receiving the specialized agricultural credit (Table-6.3). In question of acceptability of the charges, 82.5 percent of credit recipient farmers mentioned that the charge is at acceptable range. But requiring extra expense is less acceptable mentioned by 12.5 percent and unacceptable mentioned by 5 percent of credit recipient farmers (Table-6.4).

**Table 6.4: Acceptability of Extra Expense to Get SAC**

Acceptability	No. of recipient farmers	Percentage of recipient farmers
Acceptable	33	82.5
Less acceptable	5	12.5
Unacceptable	2	5.0
<b>Grand total</b>	<b>40</b>	<b>100</b>

Source: Field Survey, 2021

#### 6.5 Specialized Agricultural Credit Utilization Pattern of the Farmers

It is observed that farmers in the study area utilized their maximum part of specialized agricultural credit for onion cultivation (88.38 percent) followed by other crop cultivation (5.13 percent), family expenditure (4.12 percent) and livestock production (2.37 percent) (Table-6.5). To make the appropriate use of credit Rahman *et al.* (2011) suggested that agricultural credit should be disbursed at the beginning of crops cultivation and repayment should be made after getting returns from the investment. In this study, farmers got credit at the beginning of the onion cultivation (01 November–31 December) and they had utilized their capital properly.

**Table 6.5: Specialized Agricultural Credit Utilization Pattern (Percentage)**

Onion cultivation	Other crop cultivation	Family expenditure	Livestock production	<b>Total</b>
88.38	5.13	4.12	2.37	<b>100</b>

Source: Field Survey, 2021

## **CHAPTER 7**

### **IMPACT OF SPECIALIZED AGRICULTURAL CREDIT ON ONION PRODUCTION**

The fourth objective of the thesis is “To evaluate the impact of specialized agricultural credit on onion production”. Results explaining the fourth objective of the study are discussed in this chapter.

It is essential to have a clear and realistic understanding of the specialized agricultural credit (SAC) policy intervention and its outcome to ensure proper implementation of the SAC scheme. The results discussed in this chapter will assist policy makers in determining the impact of specialized agricultural credit on onion production. The findings of this chapter may also be helpful to encourage the onion cultivators to use specialized agricultural credit by making them understand the comparative advantage of using SAC.

To explore the fourth objective of the study, the Cobb-Douglas type production function analysis has been conducted. For this, equation-(2) from the chapter-3 (Methodology) is used. To check validity of the model, the following tests have been conducted.

At first, heteroscedasticity test is conducted. Where chi-square value is 0.22 and probability is 63 percent which is insignificant. That’s why heteroscedasticity is not a problem in our analysis.

Secondly, correlation matrix is generated to check collinearity issues among the variables used in equation-(2). It can be seen from the correlation matrix that the value of each correlation is below 70 percent where maximum correlation is 56 percent, which is under acceptable condition (Table-7.1). For instance, correlation between seed cost and fertilizer cost is 56 percent, correlation between irrigation cost and land preparation cost is 16 percent, correlation between land preparation cost and labor cost is 21 percent, correlation between specialized agricultural credit use and labor cost is 19.50 percent, and so on (Table-7.1).

**Table 7.1: Correlation Matrix of the Variables Used in Equation-(2)**

<b>Variables</b>	Seed cost	Fertilizer cost	Labor cost	Land preparation cost	Irrigation cost	Credit use
Seed cost	1.0000					
Fertilizer cost	0.5628	1.0000				
Labor cost	0.4365	0.2615	1.0000			
Land preparation cost	0.3473	0.1663	0.2140	1.0000		
Irrigation cost	0.5553	0.4738	0.4170	0.1600	1.0000	
Specialized Agricultural Credit use	0.5431	0.4396	0.1950	0.2757	0.3827	1.0000

Source: Field Survey, 2021

From Table-7.1 it can be seen that, value of each correlation is below 70 percent. So, we don't have any severe collinearity issues in the estimated model.

Besides, we test the VIF (Variable Influence Factor) which shows that the overall VIF is 1.58 ranging from 1.17 to 2.24 which is less than 10 (Table-7.2).

**Table 7.2: VIF Test Results of the Equation-(2)**

<b>Variable</b>	<b>VIF</b>	<b>1/VIF</b>
Seed cost	2.24	0.447222
Fertilizer cost	1.64	0.609679
Labor cost	1.60	0.624877
Land preparation cost	1.52	0.659165
Irrigation cost	1.33	0.752362
Specialized Agricultural Credit use	1.17	0.855813
<b>Mean VIF</b>	<b>1.58</b>	

Source: Field Survey, 2021

For instance, it can be seen from Table-7.2 that, VIF of seed cost is 2.24, VIF of fertilizer cost is 1.64, VIF of labor cost is 1.60, VIF of specialized agricultural credit use is 1.17. So, based on the VIF test results, no serious problem of multicollinearity is detected for the estimated equation.

Therefore, we estimated the regression using equation-(2) and the estimated results are given below:

**Table 7.3: Impact of Specialized Agricultural Credit (SAC) on Onion Production**

Variable name	Regression coefficient	Standard error	P-value
Seed cost	0.265***	0.009	0.000
Fertilizer cost	0.014*	0.008	0.097
Labor cost	0.006*	0.004	0.088
Land preparation cost	0.0005	0.005	0.899
Irrigation cost	0.008	0.011	0.476
Specialized Agricultural Credit use	0.0713***	0.013	0.000

Source: Field Survey, 2021

**Note:** Dependent variable: Onion yield (mounds/ha)

‘\*’, ‘\*\*’, ‘\*\*\*’ denote significant at 10%, 5% and 1% level, respectively.

**Seed cost:** From Table-7.3 it can be seen that the seed cost variable is significant at 1 percent level. Therefore, if cost seed cost increases by 1 percent then per hectare production of onion will be increased by 0.265 percent. This is an important threshold because may be the amount or quality of seed is used in lower stage. So, still farmers have enough scope to increase the production of onion using more quality seed.

**Fertilizer cost:** From Table-7.3 it can be seen that the fertilizer cost variable is significant at 10 percent level. It should be mentioned that, here we considered the use of chemical fertilizers. Therefore if cost of chemical fertilizer use increases by 1 percent then per hectare production of onion will be increased by 0.014 percent. So, still farmers have scope to increase the production of onion using more chemical fertilizer efficiently up to a certain level.

**Labor cost:** From Table-7.3 it can be seen that the labor cost variable is significant at 10 percent level. Therefore if labor cost increases by 1 percent then per hectare production of onion will be increased by 0.006 percent. So, still farmers have scope to increase the production of onion using more labor up to a certain level.

**Land preparation cost:** It can be seen from Table-7.3 that, the sign of the land preparation cost variable coefficient is positive which is in line with our expectation but the coefficient of the variable is insignificant. The reason behind this phenomenon may be the farmers of the study area maintain on an average same precautions during land preparation.

**Irrigation cost:** From Table-7.3 it can be seen that the sign of the irrigation cost variable is positive which is in line with our expectation but the coefficient of the variable is insignificant.

**Specialized Agricultural Credit use:** From Table-7.3 it can be seen that the Specialized Agricultural Credit use variable is highly significant at 1 percent level in onion cultivation. Therefore, for those farmers who use Specialized Agricultural Credit (SAC) in onion cultivation, their per hectare production of onion is 7.13 percent higher compared to those who don't use Specialized Agricultural Credit (SAC). This result is consistent with some other studies (Abdallah, 2016; Afrin et al., 2017; Ahmed et al.,2014; Asadullah and Rahman, 2009; Bashir et al.,2010; Besharat and Amirahmadi, 2011; Chandio et al.,2018; Chandio et al.,2021; Hussain, 2013; Kassali et al.,2009).



## CHAPTER 8

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 8.1 Summary

The study is conducted mainly to have a realistic understanding of factors affecting access to specialized agricultural credit, utilization pattern and impacts of specialized agricultural credit (SAC) on onion production. Some descriptive statistics have been used to assess the socio-economic profile of the onion cultivators. In this study, the binary discrete choice model (logit model) is used to find out the determinants of access to SAC. After that, to explore the utilization pattern of SAC for onion cultivation mostly descriptive statistics (average, percentage) is used. Finally the Cobb–Douglas production function analysis is applied to evaluate the impact of SAC on onion production. Primary data has been collected from Sujanagar and santhia upazila of Pabna district- traditionally rich in onion production for conducting the analyses. A total of 80 onion cultivators were interviewed using a well-structured questionnaire for data collection.

Farmers socio-economic profile analysis reveals that, around 21 percent of the sample farmers were 26-35 years old, 35 percent were 36-45 years old 30 percent were 46-55 years old and 14 percent were over 55 years old in the research region. So, the majority of individuals were between the ages of 36 and 45 in the study area (Figure 4.1). Overall 15 percent of farmers have no education/illiterate, around 46 percent have a primary level of education, 26 percent have a secondary level of education and approximately 13 percent have a higher secondary level of education in the study area. So, the majority of individuals in each upazila have a primary level of education (Figure 4.2). Altogether, around 86 percent of the respondents are married and 14 percent are unmarried in the study area (Figure 4.3). The average family size in the study region is 5.42, whereas the average family size in the nation is 4.06 (Table 4.1). Overall 28.75 percent are small farmers, 56.25 percent are medium farmers and 15 percent are large farmers in the study area. Thus, the majority of respondent farmers (56.25 percent) fall in the category of medium farmer (Table 4.3). Average annual farming income of the sample farmers in the study area is Tk. 86,750 (Table-4.4) and

majority of them (around 64 percent) depend only on farming activities for their living (Figure-4.4).

The binary discrete choice model (logit model) analysis indicates significantly positive relationship between access to SAC and farmer's education level, family size, farm size, and farming income (Table-5.). Findings of the logit model analysis reveals that all the variables under consideration have expected signs except farmer's age. Among the variables, farmer's age and family size are significant at 1 percent level, farming income is significant at 5 percent level, and education and farm size are significant at 10 percent level. However, non-farm income variable is not statistically significant even at 10 percent level (Table-5.). The marginal effect of age is negative (-0.015) which implies that aged farmers are risk-averse and reluctant to receive credit. The marginal effect of education is 0.264 which implies that literate farmers are 26.4 percent more likely to receive SAC compared to the illiterate farmers. The marginal effect of family size is 0.104 indicating that farmers' probability to receive SAC will be increased by 10.4 percent if family size increases by 1 percent. The marginal effect of farm size is 0.260 which implies that if farm size increases by 1 percent then farmers' probability to receive SAC will be increased by 26 percent. The marginal effect of farming income is 0.145 which indicates that if farming income increases by 1 percent then farmers' probability to get SAC will be increased by 14.5 percent.

Credit non-recipient farmers mentioned various reasons of not getting specialized agricultural credit (Table-5.4). Majority of the sample farmers (77.5 percent) mentioned lack of information and knowledge about SAC as the main reason behind not receiving credit facility. 40 percent of the non-recipient farmers mentioned lack of communication with UAO and the bank as a reason of not getting SAC. About 38 percent of the farmers cited lack of understanding of the credit acquisition process as a reason for not getting SAC. Of the total credit non-recipient farmers, 20 percent reported small loan amounts compared to the actual demand as a reason for not getting SAC. The other reasons mentioned by the non-recipient farmers were they didn't have ability to keep collateral (10 percent), didn't have any need to take credit (10 percent), didn't want to pay interest (2.5 percent) (Table-5.4).

It is observed that, farmers in the study area utilized their maximum part of SAC for onion cultivation (88.38 percent) followed by other crop cultivation (5.13 percent), family expenditure (4.12 percent) and livestock production (2.37 percent) (Table-6.5).

Results of the Cobb–Douglas production function analysis indicates that all the variables under consideration have expected signs. Among the variables, seed cost and specialized agricultural credit use are significant at 1 percent level, fertilizer cost and labor cost are significant at 10 percent level. However, land preparation cost and irrigation cost are not statistically significant even at 10 percent level (Table-7.3). The coefficient of seed cost is 0.265 which implies that if seed cost increases by 1 percent then per hectare production of onion will be increased by 0.265 percent. The coefficient of fertilizer cost is 0.014 which indicates that per hectare production of onion will be increased by 0.014 percent if cost of chemical fertilizer use is increased by 1 percent. The coefficient of labor cost is 0.006 which implies that if labor cost increases by 1 percent then per hectare production of onion will be increased by 0.006 percent (Table-7.3).

Specialized agricultural credit use was our interest variable. The estimates of Cobb–Douglas production function analysis affirms significantly positive impact of SAC on onion production. The coefficient of specialized agricultural credit use is 0.0713 which is significant at 1 percent level and implies that for those farmers who use SAC in onion cultivation, their per hectare production of onion is 7.13 percent higher compared to those farmers who don't use SAC (Table-7.3). This result is consistent with some other studies (Abdallah, 2016; Afrin et al.,2017; Ahmed et al.,2014; Asadullah and Rahman, 2009; Bashir et al.,2010; Besharat and Amirahmadi, 2011; Chandio et al.,2018; Chandio et al.,2021; Hussain, 2013; Kassali et al.,2009).

Findings of the study reconfirms that the specialized agricultural credit access and use in the cultivation process can enhance the onion production and overall income of the farmers. Since financial requirements of the farming sector have increased tremendously over the last few decades due to the extended use of improved seeds, chemical fertilizers, mechanization etc., secure and timely availability of crop-specific credit can help the farmers to use inputs in a timely and recommended manner. Thus, it can be said that SAC is an effective component to increase domestic onion

production, farmers' income generation from onion cultivation and to reduce the country's import dependency.

## **8.2 Conclusion**

The present study assessed socio-economic profile of the onion cultivators and analyzed the determinants of farmers' access to specialized agricultural credit (SAC) in some selected areas of Pabna district. In addition, this study also explored the utilization pattern of SAC and examined the impact of SAC on onion production in the same study area. The study found that among the socio-economic determinants, farmer's education level, family size, farm size, and farming income were positive and significantly influenced farmers' access to SAC (Table-5.3). Findings of the study also reveals that, farmers in the study area utilized their maximum part of specialized agricultural credit (88.38 percent) for onion cultivation (Table-6.5). Furthermore, the study found that SAC has a significant positive impact on onion production. For those farmers who use SAC in onion cultivation, their per hectare production of onion is 7.13 percent higher compared to those farmers who don't use SAC (Table-7.3).

Since SAC has significantly positive impacts on the increasing production of onion, Bangladesh Bank (BB) and government authorities should address the problems and challenges farmers faced regarding access to and utilization of SAC for widespread and effective implementation of the policy.

Analyzing the data obtained from the field survey, it is observed that, limited access to SAC is mainly attributed to lack of information and knowledge about SAC, lack of communication with UAO and the bank, lack of understanding of the credit acquisition process, small loan amounts compared to the actual demand of the farmers, lack of land ownership and unavailability of collateral securities among small farmers, and low income level of small farmers. A key observation was that the large farmers have greater access to SAC due to significant landholdings, political influence, and connections with the UAO and bank managers (Table-5.4).

The study concludes that, Bangladesh Bank (BB) and government authorities should critically review these problems and challenges to devise appropriate solutions.

Influence of the significant socioeconomic determinants should assist as a guide in efficient supply of SAC to rural farming communities in the future.

### **8.3 Recommendations**

After analyzing the data collected from the field survey the present study comes up with following recommendations:

- Government and Bangladesh Bank should create farmer friendly environment to disburse specialized agricultural credit (SAC) for onion cultivation.
- Bangladesh Bank and government authorities should provide information through both electronic media and print media about SAC in farming communities so they have an easy way to access to the related information. DAE officials, UAO and local representatives should be involved in campaign for widespread dissemination of information about SAC programme and to improve communication with the farmers.
- The procedure of credit acquisition should be made simple and easy for the small farmers. Bangladesh Bank should make the collateral keeping step more flexible for the small and marginal farmers so that it could be a good opportunity for them to overcome the capital constraints in onion farming.
- Total supply of credit should be increased under the SAC scheme as the demand for credit is higher compared to the amount disbursed. Ceiling of SAC should also be increased as costs of inputs have risen over time. Moreover, time of repayment should be increased so that farmers don't have to sell the produce immediately after harvesting at a lower price.

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