**YANGON UNIVERSITY OF ECONOMICS**

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**EFFECT OF CREDIT ACCESSIBILITY ON FARM PERFORMANCE**

**IN MAUBIN TOWNSHIP, AYEYARWADY DIVISION**

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# EFFECT OF CREDIT ACCESSIBILITY ON FARM PERFORMANCE IN MAUBIN TOWNSHIP, AYEYARWADY DIVISION

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# ABSTRACT

This study aims to examine the credit accessibility and agricultural loan on farm performance in Maubin Township based on primary and secondary data. The sample size of 110 farmers was randomly selected and surveyed using structured questionnaires. Descriptive analysis and multiple regression method are used. According to the survey, the household size of the respondent is from two to seven members. Their farming experience is from 11 to 20 years and their main source of earning is farming. Their living standard is above average level with the ownership of home, motorcycle and almost they owned farm land and cows. They owned cultivated land of acres fifteen at maximum. Average paddy yield per acre is round about 60 bushels. They borrowed loan from MADB bank and some from other financial organizations. However, most of farmers received loan just after farming period. More than half of farmers covered about fifty percent loan sufficient rate. According to multiple regression analysis, number of cows, ownership of water-pump, loan coverage percent and duration of loan period are significantly related with paddy yield per acre and annual household farm income. The study showed that the effect of loan coverage percent and duration of loan period is greatest on paddy yield per acre and annual household farm income. Therefore, agricultural credit should be provided to farmers sufficiently and timely manner.

# ACKNOWLEDGEMENTS

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# CHAPTER I
# INTRODUCTION

Myanmar had pursued its economy development by means of socialist economic planning system for about a quarter of a century. In the later years of 1980s, the country experienced a negative growth rate for three consecutive years. This was mainly due to low productivity in key productive sectors, which effected foreign trade and creating unfavorable balance of payments and position of foreign exchange. The investment level also declined due to decline of loans and aids from bilateral and multilateral sources. These situations called for the need to restructure the economy, and hence the Socialist Planning System was replaced by market-oriented system with the emergence of New Government in 1988.

With a view to accelerating the growth of the agriculture sector, the key sector of the national economy, a number of reform measures have been undertaken in line with the developments in the country's socio-political conditions. Principal crops including paddy, formerly controlled by the State, had been decontrolled giving the farmers a freedom of choice and flexibility in production and marketing of agricultural crops, stabilizing farm income and to a enable free flow of commodities. It has enabled the farmers to cultivate crops most suitable to their local agro-ecological conditions and to market their produce freely. Land revenue, which was assessed in terms of scheduled crops and collected in kind in 1987-88, was re-scheduled and collected in cash in 1988-89 in order to facilitate easier payment by the farmers and to ease tax administration. There was an improvement in farm income with the liberalization of farm production and marketing. The sales price of chemical fertilizers have been adjusted in 1988-89 in line with the increase in production cost and purchase price. The Agricultural Mechanization Department also adjusted its service charges in 1988-89 to partly cover the increase in its operating costs.

After decades of isolation, and with the lifting of sanctions earlier imposed by Western countries, Myanmar is actively re-engaging with the global economy. At the same time, Myanmar's rich natural resource base, abundant labor and strategic location wedged between India and China, make the country a very attractive destination for foreign investment. Over the last five years 2011-2015, Myanmar has been engaged in a process of political and economic liberalization that will transform

the country's economy and society and see the nation emerge as an important economic entity in ASEAN and the wider regional and global economy.

The potential for rapid growth and development is enormous. After more than five decades of stagnant and relative decline, the country is at a crucial juncture and seems to be on the verge of taking off as a new 'tiger' economy. Nowadays, the agricultural sector of Myanmar, including livestock and fisheries, represents between 30 to 35 percent of Gross Domestic Product (GDP) and that up to 65 percent of the labor force is directly or indirectly engaged in agricultural activities or depend on agriculture for their income (Myanmar Statistical Yearbook, 2017). As one of the major sources of the foreign earnings for the country, agriculture sector accounted for one-third of total export earnings. Given agriculture's important contribution to the economy, the modernization of the agriculture sector is a top priority in the economic and social development agenda of the Government of Myanmar.

Nevertheless, agricultural productivity in Myanmar is low in terms of both quality and quantity compared with most of Southeast Asia, which partially explains the disparity in relative incomes across the countries. Raising Myanmar's productivity to the level of its agro-ecology similar to its neighbors, and thereby spurring rapid agricultural growth, could significantly raise rural incomes and reduce overall poverty. As agriculture is the major sector of the economy and the peasant sub-sector is dominant within agriculture, strengthening and developing the peasant sub-sector is bound to stimulate the agricultural sector, which in turn will trigger the rest of the sectors of the economy, the cumulative effect of which will be a net increase in the GDP.

The majority of Myanmar's farmers are engaged in the production of rice, which occupies nearly 50 percent of total area. At the same time, a large percentage of the rural population remains landless by lack of financing, with estimates ranging from 25% to 50% depending on the region. While increasing productivity in the rice sector would improve the livelihoods of Myanmar's numerous paddy farmers, a long-term solution must be also to introduce greater diversification in the agriculture sector and to develop value chains that offer employment opportunities for the numerous landless. The shared border with more developed economies and the ASEAN agreement facilitating freer trade also offer opportunities for growth in exports of high-value commodities and processed products. The challenge remains on how to support such diversification, which will require large amounts of investment by

government and private agro-enterprises of all sizes. Government policies will likewise have an important part to play in creating an enabling environment for private sector growth.

In Myanmar, farmers are mainly classified in accord with their farm ownership:

- Farmers who own the farmed land,
- Farmers who work as a laborer on land owned by others, and
- Farmers who also rent the farmed land for a short term or long term.

Most of the farmers are poor and they need financing for their plantation during the monsoon and the winter agricultural seasons. Across the country, institutional credit is available from Myanma Agricultural and Development Bank, Ayeyarwaddy Farmers Development Bank, and the Microfinance firms while debt financing is available from informal, semi-formal outlets such as local pawnshops, merchants, the community organizations. In the study area, the Myanma Agriculture and Development bank provide the main sources of financing and there are less of other funds lenders.

## 1.1    Rationale of the Study

There is consensus among policy makers, economists, and business experts that small-scale farmers are drivers of economic growth in agricultural based economy. A healthy agriculture sector contributes prominently to the economy through creating more employment opportunities, generating higher production volumes, increasing exports and introducing innovation and entrepreneurship skills. The dynamic role of agriculture sector in developing countries insures them as engines through which the growth objectives of developing countries can be achieved.

In many developing countries, agricultural credit programs are not very successful and often in serious difficulties due to heavy loan delinquency and high default rate. It is no exception to a developing country like Myanmar: financing to farmers is limited and few sources of official financing programs. The farmers are need financing to spend money on these agricultural inputs such as costs of land preparation, fertilizers, seeds, pesticides, labor hiring fees and rental fees of machinery. There are currently converting conventional small-scale farm into mechanized farms in the form of acre to hectare-plots in order to change manual farming into mechanized farming. To build the modern industrial nation through

agricultural development, the farmers need the machinery (cultivators) while they prepared the land and need the harvesters while they harvest the plantation. These machines give farmers to save times and get more efficiency.

On the view of neighbor country 'Thailand' provided the financing to the farmers, the Bank for Agriculture and Agricultural Co-operatives (BAAC) have launched in 2011, the loan cards issued to local farmers to gain loans with a cheap interest rate than other lenders. Additionally, if the farmers can submit the proposal, the bank offers a credit line for up to seventy percentage of farmers' production value and sales. The farmers can use the cards to pay for fertilizer, seeds, farm machinery and pesticides at participating suppliers. In this process, the bank can monitor their use of payment whether they spent on the actual industrial inputs or other personal consumption. In view of Myanmar, a farm is a primary source of collateral; the rice farmers are able to borrow more money from the MADB bank than non-rice farmers are. However, there is limited amounts of financing offers with a cheap interest rate. Other than official way of borrowing, the farmers have to do financing from the un-official ways with the higher interest rate.

It is important that these borrowed funds are invested for productive purposes and then the generated additional incomes be used to repay to the lending institutions to have sustainable and viable production process. This thesis aims to study the importance of how effective given the loans to the farmers and raise their working life, mainly how the farmers are managed their hard-financial situation. The study has selected a Maubin Township, Ayewaddy division. The main reason is that a significant proportion of the local population in this area are farmers and paddy is their main plantation in this area as well. After completion of this study, it shall be able to provide an effective recommendation to the banks as well as government to make effective policy of loans that is helpful for farmers and economy of Myanmar.

## 1.2    Objective of the Study

The specific objectives of this study include the following objectives:

(1)    To identify the credit accessibility of farmers in Maubin Township and

(2)    To examine the effect of credit accessibility on farm performance in Maubin Township.

## 1.3 Scope and Method of the Study

This study is concerned with agricultural credit (small-scale loan) activities only. Large–scale lending programs have been kept outside of the study. This study focuses on financing of farmers in Maupin Township. Descriptive statistics method is used to analysis in this study and concerned both of primary and secondary data. In primary data, 110 farmers out of 10976 borrowing farmers were selected by simple random sampling method. After choosing the sampled farmer, face to face interview with structured questionnaire was used to collect the required data. The secondary data is collected from the respective township's administration department, township's agriculture and development bank, websites, previous researches and others reports from internet. The period of data collection will be from July 2018 to September 2018.

## 1.4 Organization of the Study

This study is organized into five chapters. The chapter one is the introduction, included in rationale of the study, objectives of the study, scope and method of the study and organization of the study. The chapter two covers the literature reviews of the various types of financing for farmers. The third chapter presents the background information of the agricultural sector in Myanmar and paddy farmers in Maupin Township. The chapter four describes the analysis on the financing usage and repayment of farmers. The last chapter includes the conclusion, recommendations and suggestions of the study.

# CHAPTER II
# LITERATURE REVIEW

This chapter presents a review of the literature on the theories and research finding from previous studies about agricultural credit accessibility and firm performance. The chapter is structured based on the research questions. The section would seek to review topics such as nature of agricultural finance, role of agricultural credit, accessibility of agricultural credit and sources of agricultural finance and types of agricultural loan. Sections on empirical literature review will follow respectively. The chapter will end with a conceptual framework of the study covered under the literature review.

## 2.1 Concept of Agricultural Credit

The concept of credit in agriculture has been known since the seventeenth century when peasants in China used rural credit in farm production to increase their cash income, and to improve their standard of living (Ming-te, 1994). Likewise, in Western countries, the German Landschaften was founded by Frederick the Great in 1769, and its principles were used by the Federal Farm Loan System of the United States. The Raiffeisen Agricultural Bank and the Schulze-delitzsch People's Bank were established in 1852, which were believed to be the origin of the establishment of cooperative institutions worldwide (Belshaw, 1931).

According to Heidhues and Schrieder (1999), the origin of the credit concept stems from the necessity to break the vicious circle of low capital formation. They claimed that that the formation of capital is influenced by per capita income, savings rate, investment rate, and productivity. A low level in any of these factors will affect capital formation. It is argued that the role of credit programs is to break this cycle, resulting in an increase in per capita income and thus an increase in savings rate, investment rate and productivity (Heidhues & Schrieder, 1999).

Agricultural credit or finance generally means studying, examining and analyzing the financial aspects pertaining to farm business. The financial aspects include money matters relating to production of agricultural products and their disposal. Agricultural Finance is dedicated to financing agricultural related activities such as input supply, production, processing and distribution (Meyer, etal. 2004). Murray (1953) defined agricultural finance as "an economic study of borrowing funds

by farmers, the organization and operation of farm lending agencies and of society's interest in credit for agriculture." Tandon and Dhondyal (1962) defined agricultural finance "as a branch of agricultural economics, which deals with and financial resources related to individual farm units." Farm finance has become an important input due to the advent of capital-intensive agricultural technologies. Farmers require capital in order to enhance the productivities of various farm resources.

Agricultural finance is the economic study of the acquisition and use of capital in agriculture. It deal with the supply of and demand for funds in the agricultural sector of the economy. Knowledge of fundamental economics and management principles and analytical procedures facilitates obtaining control over capital it will pay to allocate to alternative uses. Financial analysis relating to income, repayment capacity, and risk management indicates the total amount of capital the farm business can profitably and safely use. Information on· the legal aspects of borrowing, leasing, and contractual arrangements helps the farmer select the means of acquiring knowledge of the legal and financial aspects of retirement and estate planning can ensure an orderly transition and transfer of the farm business to the next generation.

Agricultural finance needs to focus on the following four factors (World Bank, 2015). They are segmenting the smallholder farmers and identify their financial needs, finding ways to de-risk agricultural finance, identifying appropriate institutions and delivery channels for loan and addressing issues in the enabling environment and specific government policies (World Bank, 2015).

## 2.2    Role of Agricultural Credit

Credit is essential for agricultural development and is often a key element of agricultural modernization. It cannot only remove a financial constraint but it could also increase production and income, and may accelerate the adoption of technologies (Meyer & Nagarajan, 2000). It can improve income by enabling the undertaking of additional income-generating activities, and the rural households can finance more consumption and have surplus finance available for further investments (Rosenzweig, 2001).

Likewise, credit facilities will help farmers purchase modern inputs such as high-yielding varieties of seeds, fertilizers, and install irrigation to increase production (Vicente & Vosti, 1995). For decades, rural credit has been primarily seen as

promoting agricultural production by farmers and making rural progress possible through growth in farm productivity (Llanto, 1993; Panin et al., 1996).

It is generally an accepted view that agricultural credit programs can be successful only if they are part of an "integrated approach" to rural development problems (Rashid et al., 2004). Granting production loans to small farmers is viewed as a means to augment food production pursued by many donors and governments in developing countries (Irungu et al., 2005).

At various points in time, farmers rely on external credit because as producers they prefer to hold their savings in physical productive assets on their own farms. It can be noted that farm income and expenditures do not occur at the same time (Desai & Mellor, 1993). A good example of this is a rice farmer who harvests his crops twice or thrice a year whereas his consumption expenditure is continuous. Likewise, for a tree-crop farmer there is a big gap between the times when income is generated and when expenditure is incurred (Desai & Mellor, 1993). Moreover, in the event of unforeseen situations such as bad weather, accidents and illness, rural households usually resort to emergency sales of assets and borrow from family and the informal sector (Chowdhury & Garcia, 1993). The poor have traditionally obtained credit services almost exclusively from informal networks because they have little or no collateral to offer (Pal, 2002).

The majority of poor small farmers in developing countries are left out of agricultural extension and credit systems (Lal et al., 2003). These households are characterized by landholdings of less than 1 hectare and very low crop yields. These rural households are unable to grow enough food to feed themselves even though they focus much effort on producing food crops (Lal et al., 2003). It has been noted that most of the farmers are too poor and cash-strapped to be able to benefit from any kind of access to credit (Diagne & Zeller, 2001).

Access to credit is limited in rural areas although a high demand for it exists (Sahu et al., 2004). Thus, establishing formal credit institutions in rural areas for small farmers is considered an adequate financing strategy to help improve their income and livelihood strategies (Heidhues, 1995). In addition, the proximity of formal credit institutions in the rural areas encourages financial savings from the small farmers and discourages their borrowing from informal lenders (Rosenzweig, 2001). Designing sustainable rural financial systems could provide an adequate financing strategy for small farmers. A better understanding of existing informal institutions at the

household and community levels could provide the key to designing sustainable rural financial systems that serve the poor (Zeller et al., 1997).

## 2.3 Accessibility of Agricultural Credit

Credit accessibility refers to the ease or difficulty of acquiring credit by borrowers for purpose such as to enhance business performance (Salalmddin, 2006). The accessibility of credit is still fairly constrained, and particularly access to formal credit for small and medium farmers. These forces constrained borrowers to turn to more expensive and unreliable informal credit sources (Okurutu et, al, 2004). Credit has a crucial role for elimination of farmer's financial constraints to invest in farm activities, increasing productivity and improving of quality and quantity of farm products so, that it can increase farmers. Credit accessibility is important for improvement of quality and quantity of farm products so, that it can increase farmer's income and avoid from rural migration. On the other hand, some policy makers believe that payment of credit with low interest rate to farmers can support them against some results of development policies that threat their welfare (Ghorbani, 2005). Therefore, with limited access to credit, the budget balances becomes a constraint, where expenditures have to remain less or equal to the sum of revenues during the period, accumulated saving and credit availability. Hence, credit constraint limits the optimum production or consumption choices (De Janvry and Sadoulet, 1995).

In other words, if producers face an infinite supply of liquidity at a given price, the production decisions will be independent of consumption decisions. When credit is rationed, some borrowers cannot obtain the amount of credit they desire at the prevailing interest rate, nor can they secure more credit by offering to pay a higher interest rate. In such circumstances, liquidity can become a binding constraint on many farmers operations. Facing such a situation, households gave to choose how to invest and what inputs to buy, depending on the level of credit they receive.

One of the financial institutes has an important role in financing agriculture sector is agricultural bank. This bank can direct agricultural credit flow such that helps general economic policies of government. Therefore, the duty of agricultural bank is financing of farmer and related industries and participation in activities that private sector cannot invest in it. In fact, access to credit for farmers is accompanied with some problems (Ghorbani, 2005). Recent theoretical and empirical study in

economics has established that _credit markets in developing countries work inefficiently due to a number of market imperfections. The literature cites a number of market imperfections, which lead some potential borrowers to be rationed out of the credit market. Regards to results of rural credit literature, farmers with credit access problems will invest less in capital assets and their land.

In some developing Asian countries, agricultural credit policy heavily relies on commercial banking, the rigid mechanism of which is not compatible with the resources of the small-scale farmers. This has resulted to lower access by the farmers to financial resources. In developing countries where physical collateral is a major problem, land certification program could be one of the national policy options. Specially, the activities sought to address three major problems: the debt burden of farmers in debt; improving access to farm credit by small-scale farmers; and financial institution's sustainability and non-performing loan.

The outcomes of this is that only a small proportion of the total number of rural households an farmers credit from the formal sector. For a second time, among those with access to institutional credit, a very small group particularly the rich and the elites in the village receive a very large share of the total amount disbursed. Consequently, the overwhelmingly constrained borrowers are forced to turn to the rather expensive and unreliable informal credit sources.

## 2.4    Sources of Agricultural Credit

Farmers need the financial credit required for investment in agricultural sector. The farmers receive the required credit from different sources, which can be classified into two sectors. Credit is also classified based on lender according to such as:

- Institutional Credit
- Non-Institutional Credit

Some features of these credit sources are discussed below.

### 2.4.1  Institutional Credit

The institutional sources, which provide the credit to the farmers, are known as organized sources of agricultural credit. They are organizations that are owned, controlled, licensed and registered or regulated by the government. These include the commercial banks, state-owned banks, agricultural development banks and rural banks (Martokoesoemo, 1994). Most of the commercial banks are active in urban

centers financing trade business while the agricultural development banks are usually situated in rural areas serving mostly farmers. They provide transfers, savings, and lending services. They are established especially for the development of agricultural sector. Commercial banks, regional rural banks and cooperative banks mainly do institutional funding of the farm sector.

Based on the study by Chowdhury and Garcia (1993), the number of loans from the formal financial institutions in the developing countries obtained by rural borrowers is low. The reasons for such low ailment include complicated and lengthy loan procedures that often overwhelm the poor and uneducated farmer-borrowers. In addition, obtaining loan from formal institutions overburdened the rural borrowers in terms of slow release of the funds and higher transaction costs, which led them to borrow from informal sources instead (Chowdhury & Garcia, 1993). Moreover, some restrictive features of loans also affects them. One is the credit scope limited to only a specific commodity, and another is the security requirements, as the borrowers do not have the assets to support their credit (Martokoesoemo, 1994). In some cases, many remote rural areas lack banking and other institutional facilities and credit services (Chowdhury & Garcia, 1993).

## Government

The government banks extend both short term as well as long-term loans. These loans are generally advanced in times of natural calamities. The Asian Development Bank provides short-term (less than one year), medium-term (one to five years) and long-term (more than five years) credits to the farmers (ADB, 1989). The rate of interest is low and it is not a major source of agricultural finance.

## Cooperative Credit Societies

Cooperatives are also the most important source of institution credit available to the farmer. In many of the Asian countries (Ceylon, India, Japan, the Republic of Korea, the Republic of Vietnam), the agricultural credit available through cooperatives accounts for four-fifths or more of the institutional agricultural credit. In Taiwan, the credit directly provided by multipurpose cooperatives, called farmer's associations, accounts for about one-third of total institutional credit, and the bulk of the balance is disbursed and recovered by these cooperatives as agents of various government bureau (Faridabad, 1967).

**Commercial Banks**

Commercial banks are corporations chartered under federal or state law. Previously commercial banks were confined only to urban areas serving mainly the activities of trade, commerce and industry. The insignificant participation of commercial banks in rural lending was explained by the risky nature of agriculture due to its heavy dependence on monsoon, unorganized nature and subsistence approach. In the past, commercial banks were made to play an active role in agricultural credit and they are still the largest source of institutional credit to agriculture. From the farmer borrower's point of view, commercial banks have several advantageous features. They can give prompt credit service with a minimum of red tape, they are readily accessible, and they alone can provide a full range of financial services, including checking accounts, saving accounts, trust counseling, estate planning, investment counseling, farm management services, charge cards, and safety deposit boxes (Murray, et.al,1980).

**Regional Rural Banks**

Regional rural banks were set up in those regions where availability of institutional credit was found to be inadequate but potential for agricultural development was very high. However, the main thrust of the regional rural banks is to provide loans to small and marginal farmers, landless laborers and village artisans. These loans are advanced for productive purposes.

**Microfinance**

Microfinance organization is not new to the financial market in Asian countries. Due to the overwhelming poverty in developing countries, some government gave special attention to the development of rural credit. The microfinance models are developed in order to cope with the financial challenges in financially backward areas.

Microfinance is increasingly being considered as one of the most effective tools of reducing poverty. Microfinance has a significant role in bridging the gap between the formal financial institutions and the rural poor. The Micro Finance Institutions (MFIs) accesses financial resources from the Banks and other mainstream Financial Institutions and provide financial and support services to the poor.

MFIs are the pivotal overseas organizations in each country that make individual microcredit loans directly to villagers, micro entrepreneurs, impoverished women and poor families. An overseas MFI is like a small bank with the same

challenges and capital needs confronting any expanding small venture but with the added responsibility of serving economically marginalized populations. Many MFIs are creditworthy and well run with proven records of success, many are operationally self-sufficient. Regulated, transformed organizations differ from nonprofits in that they are held to performance and capital adequacy standards and are supervised by a financial authority, typically the central bank of the country where they are registered.

### 2.4.2 Non-Institutional Credit

The local individual who provide the credit to the farmers are unorganized sources of agricultural credit. In Asian countries, the rural farmers are dependent on the unorganized sector for their agricultural credit. Informal financial institutions operate without physical collateral, involve small loans and short-term transactions, and are characterized by adaptability and flexibility of operations in a certain area (Adams & Fitchett, 1992). Lower transaction costs provide a comparative advantage for informal financial institutions because of their small-scale operations and specialization (ADB, 1989). The unorganized sources of agricultural credit are as follow:

**Friends and Relatives**

The friends and relatives of farmers provide credit to the farmers in small amount to meet day-to-day needs and emergency needs. They provide loan with or without interest and security.

**Traders and Commission Agents**

Traders and commission agents advance loans to agriculturists for productive purposes against their crop without completing legal formalities. It often becomes obligatory for farmers to buy inputs and sell outputs through them. They charge a hefty rate of interest on the loan and a commission on all the sales and purchases, making it exploitative in nature.

**Landlords**

Landowners provide the credits to the farmers for short-terms as well as long-term. Generally, short-term credit is provided with security of standing crops and cattle and long-term credit is provided with the security of land and houses. Mostly small farmers and tenants depend on landlords for meeting their production and day-to-day financial requirements.

**Money Lenders**

Despite rapid development happening in rural branches of different institutional credit agencies, village moneylenders still dominate the scene. Moneylenders are of two types, agriculturist moneylenders who combine their moneylending jobs with farming and professional moneylenders whose sole job is money lending. They provide credit with security of movable and immoveable credit with the security moveable credit with the security movable and immovable property.

## 2.5    Challenges to Agriculture Financing

The institutional credit sector in developing countries lend a much smaller share of their loan portfolios to agriculture compared to the agriculture's share of their country GDP. This limits investment in agriculture by both farmers and agro-enterprises. It also demonstrates that the barrier to lending is not due to a lack of liquidity in the institutional credit sectors, but rather a lack of willingness to expand lending to agriculture.  Even when available, much of the agriculture funding tends to be informal and short-term, precluding longer-term investments. This informal funding only partially covers the financial needs of farmers and small agribusinesses, and usually at a high cost. The challenges financial institutions face when offering financial products to agriculture are:

- The transaction costs of reaching remote rural populations,
- Higher perceptions of non-repayment due to sector-specific risks, such as production, price and market risks, and
- Financial institutions' lack of knowledge in how to manage transaction costs, agriculture-specific risks and how to market financial services to agricultural clients.

## 2.6    Empirical Literature Review

Agricultural credit and its socioeconomic impact on the lives of the farmers has been a major policy issue in the arena of public policies especially in the underdeveloped and developing economies. In such economies, agriculture sector occupies a significant slice of the pie in Gross Domestic Value Added and employment. As such, it has enticed a vast pool of researchers. There are several

studies regarding access credit of farmers. This section presents a review of some related previous studies.

Dong et.al. (2010) observe that production inputs, farmers' capabilities and education cannot be fully employed under credit-constrained situation. Based on a survey of 511 households from Heilongijiang Province of Northeast China and employing endogenous switching regression model, they conclude that agricultural productivity in the study area can be increased by 31.6% with the removal of credit-constrained situation. The study further shows that productivity and income of the credit-unconstrained farmers are higher than the credit-constrained farmers are.

Ayaz and Hussain (2011) observe that credit availability to farmers is much more important than any other factors to improve the resource use efficiency in agriculture sector. Their study is based on the 300 cross section sample farmers from Faisalbaad District of Pakistan. By employing Stochastic Frontier Production Analysis (SFA), they conclude that credit to agricultural sector has more constructive and significant impact on the farmers" technical efficiency than other factors like farming experience, education, herd size and number of cultivation practices.

Duy (2012) has analyzed 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. The study concludes that technical efficiency and rice yield were positively influenced by access to credit, education level and farm technology. It also demonstrates that access to formal credit sector had a larger effect on rice production than access to informal credit.

Devi (2012) found 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 argues that there was an enormous increase in the usage of modern seeds, modernized inputs, fertilizers and pesticides after receiving the agricultural credit, which increased yield per acre and thus the income of the farmers. She further observes that the impact of agricultural credit was more significant in non-irrigated and semi-irrigated villages than the irrigated villages.

Akram et.al. (2013) observe that access to credit results in a higher level of technical efficiency of farmers. Their study is based on a sample survey of 152 farmers from Sargodha District of Punjab Province of Pakistan. Using stochastic frontier analysis (SFA), the study concludes that agricultural credit in the study area

helped the farmers obtain the farm inputs in time, resulting in a higher level of technical efficiency.

Ayegba and Ikani (2013) observe that unregulated private moneylenders are still a major source of financing agricultural sector in Nigeria. The main obstacles for agricultural credit from formal sector include high interest rates, bureaucratic bottlenecks, late approval of loans, and unnecessary request for collateral, among others. They recommend that banks and financial institutions should create credit instruments and services tailored to the risks and cash flow patterns in the agricultural sector. The banks should open up new branches in rural areas and avoid unnecessary credit conditionality that discourage famers from borrowing.

Ibrahim and Bauer (2013) have analyzed the impact of micro-credit on rural farmers' profit taking a case of Dryland of Sudan employing the Heckman Selection Model to analyze the responses from 300 samples. The findings from the study affirm the fact that farmers with access to credit are better off compared to those who do not have such access. The study recommends that by increasing the size of the loan, efficient and sustainable technology can be made available to farmers to increase farm profits.

Sharma (2014) has analyzed the impact of agricultural credit from commercial bank on GDP growth by using the time series data of Nepalese economy covering the period 2002-2012. This study has found that agricultural credit has positively and significantly influenced agricultural GDP of Nepal. However, use of fertilizer and improved seeds have not shown any significant impact on agricultural GDP. He recommends the extension and deepening of financial service system in the rural area and facilitating the agricultural lending.

Rahman et.al. (2014) emphasizes agricultural credit as a major determinant of farm productivity. Their study utilizes logistic regression method on the 300 samples from Bawhalpur, Pakistan. With the positive association between credit and agricultural productivity, they conclude that timely provision of appropriate amount of loan to farmers is helpful for the enhancement of agricultural productivity as it enables them to purchase high yielding variety seeds, fertilizers and pesticides.

Despite the heavy dependency of rural people on agriculture as a source of income and employment, there is still a paucity of research on how the agricultural productivity can be boosted up by extending the access of farmers to better seeds, fertilizer, pesticides and modern techniques of production. There are a couple of

studies about the impact of agricultural credit on farmers' productivity and income based on aggregate time series data. However, studies related to the evaluation of impact of institutional lending to agricultural sector at household level are still lacking.

**Conceptual Framework of Previous Study**

Wanjawa (2017) analyzed contribution of agricultural loan accessibility to performance of smallholder sugarcane farmers in Kakamega County, Kenya. The study found that agricultural loans have significant effect on the performance of the farmers. The conceptual framework can be seen in Figure (2.1). The study used threshold decision-making theory proposed by Hill and Kau (1973) to analyze the determinants of credit demand by farmers. The decision-making threshold is the value of the decision making variable at which the decision is made, such that an action is selected or a commitment to one alternative made, making the end of accumulation of information.

The theory pointed out the fact that when farmers are faced with a decision to adopt or not adopt an innovation, in this case demand agricultural loan, every farmer has a reaction threshold, which is dependent on a certain set of factors. As such, at a certain value of stimulus below the threshold, no adoption is observed while at the critical threshold value, a reaction is stimulated. These factors are loan interest rates, disbursement of loan and accessibility of loan (Hill and Kau, 1973).

**Figure (2.1)    Conceptual Framework of Previous Study**

**Independent Variable**                                **Dependent Variable**

| **Loan Accessibility**<br><br>• Financial Service Innovation<br>• Collateral Requirement<br>• Credit Service Diversification | → | **Sugarcane Farm Performance**<br><br>• Output Price<br>• Tonnage (Harvest) |
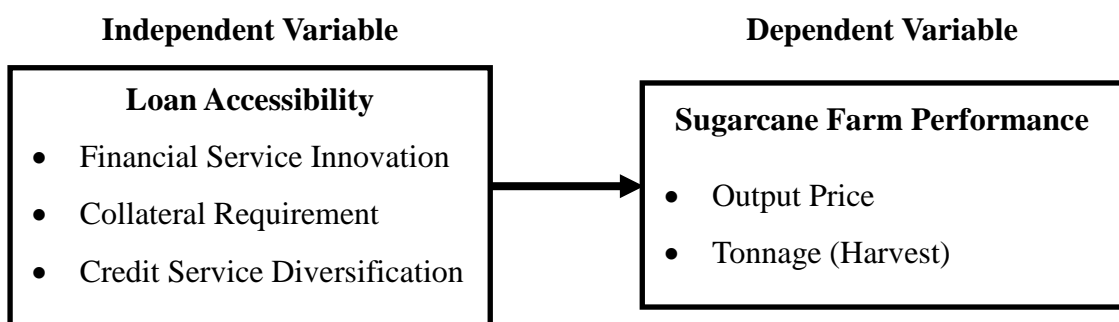
Source: Wanjawa, D., Yugi, C. and Muli, W. (2017)

As stated in Figure (2.1), agricultural loans have been used as independent variable under a construct-accessibility; dependent variable, which is performance of sugar farm, was conceptualized as pricing of the sugarcane and tonnage. The loan affects their farm produce since they cannot invest in getting good cane suckers, fertilizer as well as labor to weed their farms. In this study, accessibility of loan was

operationalized in form of flexibility of loan delivery, diversification of the loans and the innovative financial delivery services.

Obiero (2013) did not analyze the credit accessibility, but identified the social economic factors affecting farm yield. The study found that fam1er's age, farmer's experience, household size, farmer's expense and farmer's education effect on farm yield. According to the result, there is a negative correlation between farmer's age and farmer's experience and farmer's education with farm yield. There is a positive correlation between household size and maize yield. There is positive and significant correlation between farmer's expenses and maize yield.

## 2.7    Conceptual Framework of the Study

The conceptual framework for the study is constructed by considering the independent factors described above. They are the demographic characteristics of paddy farmers and agricultural credit accessibility assumed to determine its effects on farm performance.

**Figure (2.2)    Conceptual Framework of the Study**
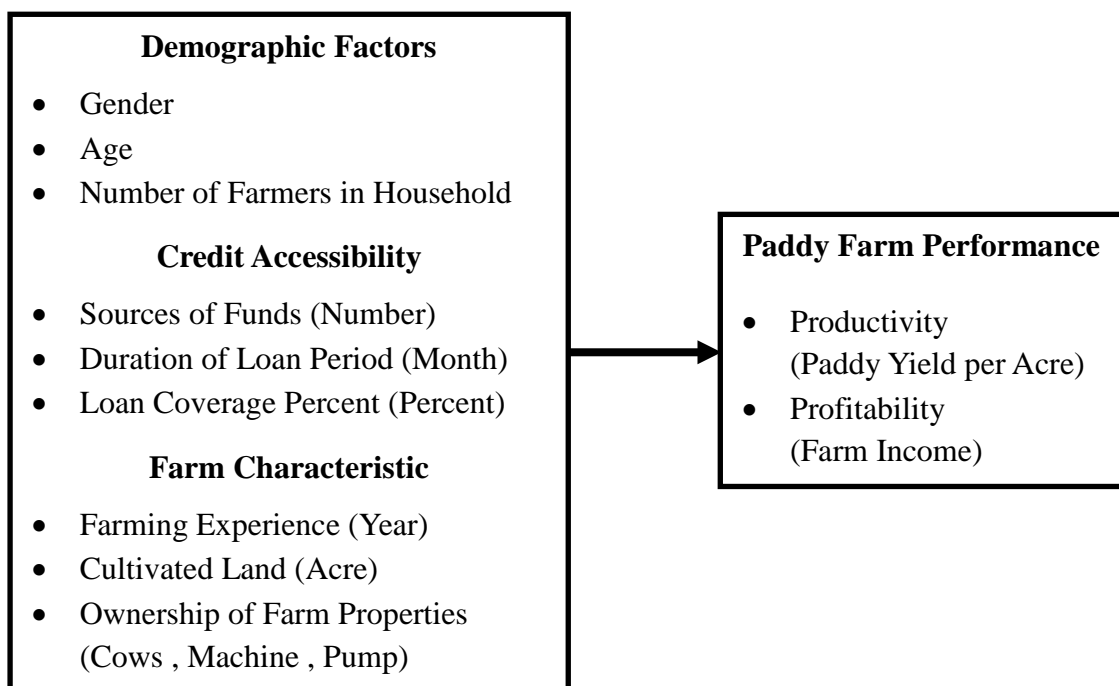


Source: Own Compilation (2018)

As presented previous section, Obiero (2013) considered farmer's age, farmer's experience, household size, farmer's expense and farmer's education effect on farm yield and found that among them, farmer's experience is significantly related with crop yields. On the other hand, Wanjawa (2017) considered loan accessibility

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(financial service access innovation, collateral requirement, and diversification of credit service) as the independent variables and farm as the dependent variable. The study found that credit accessibility affected on farm performance.

The conceptual framework for this proposed study is constructed as shown in Figure (2.2). According to the Figure, credit accessibility of farmers and background characteristics of respondents are assumed as the influencing factors on the farm performance along with other influencing factors such as farming experience, cultivated land and ownership of farm properties. To evaluate the farm performance, the paddy yield per acre is used to measure in the study.

It is important that to improve the paddy yields per acre (productivity) of the farm. The loan must be sufficient to cover the farming expenses and it should be received timely so that the profitability of the farm is improved. Therefore, in this analysis, to identify the credit accessibility of the farmers, the dimensions such as duration of loan period by month, the coverage percent of the loan amount by acre are used, and they are specified as independent factors. As for the demographic characteristics of the respondents, their gender, age, and number of farmers in the family are put into consideration to evaluate their effects. Other influencing factors including their farming experience by year, the cultivated land by acres and ownership of farm properties by cows, machine and pump are also put into consideration to evaluate their effects.

# CHAPTER III

# OVERVIEW OF AGRICULTURAL SECTOR AT MAUBIN TOWNSHIP

This chapter describes background information of agricultural loan in Maubin Township. This chapter includes overviews on agricultural sector, agriculture credit in Myanmar, Myanma Agricultural Development Bank and Other Financial Institution in Myanmar, background information of Maubin Township and Financial Institution in Maubin Township.

## 3.1 Myanmar Agriculture Sector Overview

Agriculture is the backbone of Myanmar economy not only contributing to the overall economic growth of the country and but also sustaining a standard of living for more than 60 percent of the Myanmar population. An estimated 26 per cent of the Myanmar population is living below the poverty line. Poverty in Myanmar is concentrated in rural areas, where the poor rely on agricultural and casual employment for their livelihood. Many live near the poverty line and are sensitive to economy-wide shocks. Agricultural sector plays a remarkable role in reducing poverty in Myanmar for many years to come because it supplies necessities of human life, provides basic inputs for industries and, in addition to these, purveys goods for exports and other purposes. It is extremely crucial to Myanmar's economy and future sustainable growth (Ramree, 2017). Agriculture is the second largest export commodity and the most important sector for the country's economy.

For decades, the agricultural productivity has faced extensive government controls and underinvestment in the sector. The government has now recognized the importance of the agricultural sector to economic development by kicking off a comprehensive reform program in 2011. Myanmar agriculture policies developed in 2015 are described as follows,

1. To emphasize production and utilization of high-yielding and good quality seeds.

2. To conduct training and education for farmers and extension staff on advanced agricultural techniques.

3. To implement research and development activities for sustainable agricultural development.

4.    To protect farmers rights and benefits.

5.    To assist farmers to get fair price on their produce.

6.    To assist in lowering production costs, increasing high quality crop production, developing and strengthening of markets.

7.    To encourage transformation from conventional to mechanized agriculture, production of crops appropriate with climate and extension of irrigated area.

8.    To undertake renovation and maintenance works on old irrigation, pumping and underground water systems.

9.    To support rural development and poverty reduction activities through development of agriculture sector.

10.   To encourage local and international investment m agriculture sector for the development of advanced agricultural technology and commercial agricultural production.

11.   To justify and amend existing agricultural laws and regulations in line with current economic situation.

Agriculture sector contributes 36 percent of GDP in 2007-2008; 13.3 percent of total export earning; and employs 6.12 percent of the labor force. The agriculture sector represents between 35 to 40 percent of gross domestic product (GDP) and that up to 70 percent of the labor force( of 2.5 million) is directly or indirectly engaged in agriculture products which generates between 25 to 30 percent of total export earnings (World Bank, 2014). From 1988 to 2015, Myanmar received a total of $47.89 billion in foreign investment, of which a mere $214 million was devoted to the agricultural sector. The World Bank estimates that the country's agricultural sector accounts for 38% of national GDP and 23% of exports in FY 2016-2017.

As in neighboring countries, smallholder paddy production dominates Myanmar's agricultural economy: paddy production accounts for roughly half of all cropped area. Pulses and oilseeds account for a further 20% each, whereas horticulture crops, root crops and other cereals account for the remaining part. Farmers generally grow staple crops such as paddy, pulses and oilseeds on relatively large surfaces, while high-value horticulture and fruit crops take place on much smaller plots. Paddy, pulse and oilseed farmers cultivate an average of 1.5 – 2.0 ha per holding. In contrast, onions, garlic and potato fields average about 0.6 ha each, while vegetables and cut flowers are grown on plots ranging between 0.25 and 0.3 ha in size.

Over the past decade, the Government of Myanmar has allocated nearly 0.8 million ha of land in large concessions to local agribusiness companies and, since 2010, to foreign investors. Some of the large concessions have proven commercially successful as farming businesses. Other concessionaires appear to have limited interest in farming and seem to have obtained land rights instead for speculation purposes or land rental to smallholder sharecroppers.

### 3.1.1 Current Market Situation of Agriculture Sector

Compared with international standards or even regional peers, agriculture is a very labor-intensive industry in Myanmar as most of the activities are carried out manually with low levels of mechanization. This directly links to the low productivity and agricultural output. Moreover, investment in this sector remains minimal and the industry lacks modern warehousing, distribution and logistics facilities, packaging and branding. Poor quality seeds and irrigation also hinder the agricultural sector's ability to reach its full potential. Agricultural land is also currently under-capitalized and farmers have very limited access to credit. They often have no choice but to borrow capital at exorbitant interest rates and suffer from high finance costs. Despite these challenges, the agricultural sector has the potential to see rapid growth with the introduction of better access to capital for farmers, greater availability of better seeds, more modern logistic and an increased use of technology.

Although the government has seed distribution schemes, they are under-resourced. According to the World Bank, the supply of certified paddy seeds meets no more than 1% of the potential demand. The public system, therefore, does not come close to producing enough quality seeds, and the private sector at present has not picked up the slack. Private seed providers have not been able to produce enough to meet demand, nor import the required amounts of quality seeds. As a result, many Myanmar farmers use their own seeds, which are often of poor quality. A lack of quality seeds directly equates with low productivity and is, thus, a major challenge to the growth of this sector.

Regarding credit, about 71% of farmers receive loans from the state-owned Myanma Agricultural Development Bank (MADB). In total, 80% of those loans are provided to small farmers engaged in paddy production and are only large enough to purchase inputs for the following cropping season, so are insufficient to purchase farm tools and equipment. Although MADB offers loans to farmers, there is a cap on the loan size. Farmers can take out 12-month loans of MMK 100,000 per acre for up

to 10 acres if they are growing paddy or sugar cane. Those growing sesame, pulses and peas, long cotton fiber, sorghum, and corn can take out loans of up to MMK 20,000 per acre. The interest rate is 5% per annum.

Besides MADB, the government has also been providing low interest loans to farmers under the name of cooperatives. Over the recent years, more sources of finance have emerged, such as microfinance. Private microfinance institutions (MFIs) also offer loans at low interest rates. However, with limitations such as the limited reach and loan size caps, informal sources of credit such as private moneylenders have become a major source of capital for many farmers. These moneylenders usually charge a monthly interest rate of 10-20%. Overall, the limited nature of financing sources available restricts the diversification opportunities for small farmers to local agribusiness companies and to foreign investors since 2010.

### 3.1.2 Types of Agriculture Products

Rice is grown on nearly 20 million acres (7.8 million hectares) and is by far the most common crop choice for farmers. Its closest rival, pulses and beans, are grown on 11 million acres (4.5 million hectares). Rice is grown in two seasons: summer and monsoon. The summer crop has a higher per acre yield, though farmers can only grow it on just over 3 million acres because of the limited availability of irrigation. The other main crops include sesame seed, cereal, groundnut, rubber, maize, cotton, sugarcane and coffee.

Myanmar is the world's second largest exporter of beans and pulses, after Canada. It mostly exports to India, the United Arab Emirates, Thailand, Bangladesh, and China. In 2014 alone, USD 835 million of beans and pulses were exported, exceeding the export value of rice, which was estimated to be USD 630 million.

### 3.1.3 Agriculture Finance Accessibility in Myanmar

Providing adequate access to rural finance is a common problem in developing countries and Myanmar is no exception. Myanmar has 0.05 bank branches per 1,000 km; less than a quarter of the next lowest country regionally, Cambodia. Approximately, I 0% of the population is included in the formal financial sphere, which is concentrated in the urban areas, therefore, the rate of access to formal financial services in rural areas, for agriculture or otherwise, is certain to be even lower than the national average (Kloeppinger-Todd and Sandar 2013).

The major rice-producing region is Ayeyarwady Region. It is the rice bowl of Myanmar. In 2017, Ayeyarwady Region is granted a total loan of K322390.20 million

to plant monsoon crops. MADB started disbursement of agricultural loans to more than 17,000 local farmers did from 57 villages in Myanaung Township, Ayeyarwady Region in 2018. Bago Region is the second rice producing area in Myanmar. In 2017, Bago Region is granted a total loan of K 313196.30 million to plant monsoon crops. During the meeting held by the Private Sector Development Committee (PSDC), members of the agricultural and SME sectors raised the issue that private banks do not issue loans for either sector. If Myanmar's economy is to develop, the country's SMEs and agriculture will need to take off and grow. Loans are vital for their growth. Private bank must grant a specified (minimum) percentage of their loans to farmers and SMEs (Chan Mya Htwe, 2017)

Many barriers prevent the efficient allocation of access to finance, such as lack of infrastructure, poor institutional capacity, profit-limiting policy constraints, and the dominance of state-owned banks with objectives other than profit (Steel and Charitonenko, 2003). Myanmar also lacks other financial offerings, such as formal remittance services, insurance markets, equipment rental, and grain storage (for later sales or to use as collateral), which may also contribute to the relative inefficiency of the agriculture sector.

## 3.2    Sources of Agriculture Finance in Myanmar

The provision of finance in rural areas of Myanmar derives from both state and non-state sectors and is composed of formal institutions such as state-owned banks, private banks, MFIs and NGOs and informal and semiformal outlets such as local pawnshops, merchants, community organizations and family and friends (Proximity Designs, 2014). Formal banking options include four state owned banks, 24 private domestic banks (Central Bank of Myanmar, 2017). The agricultural credit institutions are Myanma Agricultural Development Bank, Mya Sein Yaun Project, Cooperatives and Microfinance.

### 3.2.1   Myanma Agricultural Development Bank

MADB is one of the government-affiliated financial institutions, just as same as MEB, MFTB and MICB. MADB was established in June 1953 by the Government of Myanmar to support the development of agriculture, Livestock, and rural enterprises in Myanmar. At that time MADB has opened the banking function under the Ministry of Agricultural Livestock and Irrigations Starting from the 2017, the MADB has been operating under the control of Ministry of Planning and Finance.

MADB's objectives are to provide loans in a simple procedure, to promote rural banking, to encourage saving habit, to support rural socio-economic development, to cultivate habit of using banking services, to development banking services.

To achieve the MADB's objectives the operational guidelines are as follow:

(1)     Adequate supply of credit to the client

(2)     To provide credit timely

(3)     To seek full recovery off-loans

(4)     To enable farmers for investment through savings

(5)     To help to become debt-free farmers

(6)     To make bank self-replying

MADB adopts the policy that no loans are to be written off and all loans are recoverable. The repayment periods are scheduled to coincide with the income flow of the borrower's businesses. Every group members are responsible for loan repayment jointly and severally. The divisional managers and township branch managers are also responsible for full recovery of all loans with due interest. According to the MADB Law, un-discharged loans may be recovered as if they were arrears of loan revenue. In fact, the borrowers have sense of duty and in practice, they repay before loans maturity. Thus, MADB has always maintained 100% recovery even with the increase of its annual loan amount and number of micro loans account.

*Loan Guarantees***:** Most of MADB's loans (99.9 percent) require a joint guarantee of borrowers instead of collateral. Individual farmers must join a group of 2 to 3 members and collectively guarantee each individual loan. Machinery loans require collateral. The machinery is taken as collateral, and in addition and a compulsory savings of 40 percent is required for machines sold by the Government and 50 percent for machines sold by the private companies. The Government under its special projects guarantees tea-processing and coffee plantation loans.

*Types of Agricultural Loan***:** MADB offers types of loans to its customers nationwide: the seasonal crop production loan and the term loan. The season loan is designed to cover the working capital needs of smallholder farmers at the beginning of the agriculture season. Loans are divided into three categories: monsoon, winter, and pre-monsoon loans, with the first being the most important type of loan for MADB.  Loan maturity is up to one year and full repayment is expected at harvest

time. The interest rate is 8.5 percent in 2012-2013 and decreased to 5% in 2013-2014 and 2014-2015. In 2016-2017, the loan interest rate is 8% per year.

The loan amount varies according to the number of acres owned or leased by the farmer and the intended crop. Thus, the size of the land that a farmer has the right to use for agricultural activities determines the loan amount granted by MADB to each farmer. Each farmer can get a loan for a maximum of 10 acres. Table (3.1) shows loan size per acre for seasonal loan. For the Financial year 2013-2014, Ministry of Agriculture and Irrigation mandated MADB to significantly increase its individual loan amount from K 50,000 to K 100,000 per acre; for paddy and sugarcane, and from K 10,000 to K 20,000 per acre for other crops such as sesame and peanut.

**Table (3.1)    Loan Size per Acre for Seasonal Loan**

| Financial Year | Paddy (Kyat/Acre) | Sugarcane (Kyat/Acre) | Other Crops (Kyat/Acre) |
|---|---|---|---|
| 2010-2011 | 20,000 | 10,000 | 10,000 |
| 2011-2012 | 40,000 | 10,000 | 10,000 |
| 2012-2013 | 80,000 | 100,000 | 10,000 |
| 2013-2014 | 100,000. | 100,000 | 20,000 |
| 2014-2015 | 100,000 | 100,000 | 20,000 |
| 2015-2016 | 100,000 | 100,000 | 20,000 |
| 2016-2017 | 150,000 | 150,000 | 20,000 |

Source: MADB, 2017

Table (3.1) shows that for the financial year 2010-2011, loan amount is K 20,000 per acre for paddy, K 10,000 per acre for sugarcane and other crop. In 2011-2012, loan amount is double increased to K 40,000 per acre for paddy. In 2012-2013, loan amount increased from K 50,000 to 80,000 per acre for paddy and the loan amount greatly increased to K 100,000 per acre for sugarcane. The loan amount provided depend on types of paddy seeds cultivated in 2012-2013.Starting from 2013 to 2016, loan amount increased to K 100,000 per acre for paddy and sugarcane and to K 20,000 per acre for other crop. In 2016-2017, loan amount increased to K 150,000 per acre for paddy and sugarcane (Win Naing, 2017).

Term loan are divided short-term and loan-term.  Short-tem1 loan covers from 2 to 4 years and Long-term Loan covers over 4 years to 20 years. They are loans for farm investment and farm development. Term Loan can be disbursed only with

immovable properties and two reliable person's guarantees. The borrower can pledge their saving deposit, implements, machineries bought with the loan.

Term Loans are farm machinery loan, tea-processing loan (Short-Term Loan) and special project loan. Most term loans are collateralized. The farm machinery loan is the only type of loan that requires compulsory savings by the farmer. This type of loan is granted for the purchase of machinery for agricultural purposes and is given with a three-year maturity period. The repayment is divided into three installments, with an option to repay with the compulsory deposit at the end of each year. The short-term loan is provided to finance tea processing. The last subgroup is the special project loan, which is disbursed from our own sources of fund, calls Crop Loan (paddy). The loan disburse MADB to Department of Agriculture (Paddy Crop), the some Ministry, is called Government to Government Loan. MADB Managing Director and Department of Agriculture (Industrial Crop) Director General sign the Loan contract. The loan interest rate is 13%. In 20116-2017, term loan has issued 3613.52 million (Win Naing, 2017).

MADB offers the seasonal crop production loan and the term loan. Seasonal loan are divided into three categories: monsoon, winter, and pre-monsoon loans, with the first being the most important type of loan for MADB. Monsoon loan is the greatest loan amount in all type of seasonal loan. In 2014-2015, 2,717,418 people are granted a total loan of K1167485.44 million, in 2015-2016, 2,498,515 people are granted a total loan of Kl, 091,404.88 million and 2016-2017, 2,542,162 people are granted a total loan of K 1,630,623.88 million for monsoon, winter and pre-monsoon.

### 3.2.2  Other Financial Institutions of Agriculture Sector

There are other financial institutions in Myanmar for banking services. They are Department of Rural Development Cooperatives and Microfinance.

*Department of Rural Development*

Mya Sein Yaung Project was started in fiscal year 2014-2015 in Myanmar. It lend loan to rural people for rural development. It was operated Ministry of Agriculture, Livestock, and Irrigation and Department of Rural Development. It objectives are improving socio-economic development and decrease rural poverty, operating self-help livestock and cover nutrient, according to organization agreement, increase money operate in villages demand and improving rural people ability. In fiscal year 2104-2015, it was implemented 14 Regions, 70 Districts, and 288 Townships and 1450 villages in Myanmar. 3000 village was implemented in fiscal

year 2015-2016. In fiscal year 2016-2017, project was increased depending upon organization's funds to villages (9,930). Interest rate is from 6% to 18% per annual according to village committee's agreement.

*Cooperatives Associations*

Cooperatives in Myanmar have a legacy dating back to the early 1900s and have historically been seen as a tool of the government to assert their control (Ferguson 2013). However, the government sees cooperatives as a tool to help improve socio-economic conditions and microfinance as the primary method to fulfill this objective. According to government officials, there are plans to open a cooperative with microfinance services in every village in Myanmar (Ferguson 2013).

The two legal documents defining the operations of cooperatives in Myanmar are the Cooperatives Law (1992) and Regulations (1998). These documents provide the Ministry of Cooperatives the power to "liquidate" cooperatives as well as register and review their office-holders and proceedings, as well as "issue rules and procedures as it sees fit" to implement the law (Ferguson 2013).

In 2016, Loan totaling K500 billion are to be parceled out to the nation's states and regions according to the amount of rice they intend to grow and their respective population size. The bulk of money, which is being drawn from a $400million loan from China's Exim Bank, will go to the country's largest paddy producing area. Bago Region tops the list and receives K 84.656 billion worth of loans. Ayeyarwady Region receives K 80.723 billion and Sagaing Region will get K 71.897 billion.

*Microfinance Institutions*

Microfinance was firstly introduced to Myanmar in 1997, primarily as an international development assistance activity, utilizing a poverty-targeting approach and operating in the urban areas. In Myanmar, microfinance institutions (MFIs) are concentrated in the urban areas and currently are active in 12 states and divisions (Duflos et al. 2013) and continue to target the poor, especially landless farmers who cannot receive MADB suppo1i. MFIs tend to be group-based in Myanmar and their terms are stringent, mandating loan length, stipulating regular and frequent payments, and requiring attendance at group meetings (Kloeppinger-Todd and Sandar 2013).

Microfinance scheme is relatively easer for farmers to access, since the institutional finance require mortgage including real estate and deposit. Before Microfinance Law (2011), MFIs had been an informal sector but they are formal organization after the law. However, those organizations that hold license issued by

Microfinance Supervisory Enterprise (MSE) are only 118, and cooperatives, which account for more than 50% of license holders, operate in urban areas.

**3.3     Background Description of Maupin Township**

Ayeyarwady Region, one of the eight regions in Myanmar, is occupying the delta region of the Ayeyarwady River. Large areas have been cleared for paddy cultivation, leading to its preeminent position as the main rice producer in the country. Ayeyarwady Region consists of six districts, Pathein, Hinthada, Myaungmya , Maubin , Pyapon , Labutta.

Among them Maubin Township in Maubin District for field study in delta area is selected because of a lot of farming areas , high productivity, export quality of the paddy prodice and smooth transportation. Thus Maubin Township having good condition for paddy production and credit accessibility.

The background description of Maubin Township including geographic, demographic and economic conditions are presented as follows;

**3.3.1     Geographic Condition of Maubin Township**

Maubin Township is situated in the Ayyarwaddy Region of Myanmar. It is located in southeastward of the Ayyarwaddy Region. It is between 16.73° North latitude and 95.65° East longitude and 13 meters elevation above the sea level. It is 42.6 miles long from the North to the South and 22.19 miles wide from the East to the West. The total area extent of Maubin Township is 605,084 acres (945.448 sq. miles). There are 76 village tracts comprising 470 villages in Maubin Township. It is bounded by Nyaungdon Township in the North, Yangon Division in the East, Kyaiklatt Township in the South and Pantanaw Township and Wakema Township in the West.

It is an area lying on the western side of the Irrawaddy River bank, and is protected by flood-control embankments. The southern coastline lies along the Andaman Sea. The town is linked with Yangon, 40 miles (65 km) east, by the Twante Canal, which heads east. The canal opened in 1932 and improved the transporting of goods back and forth from the former capital, then known as Rangoon .Figure (3.1) shows the location of the Township.

**Figure (3.1) Maubin Township Map**



Source: Google Map

### 3.3.2 Demographic Background of Maubin Township

The population of Maubin Township increased annually indicating the growth of this township. In 2013, its population was 304,670 people consisting of 148,352 males and 156,318 females. According to 2014 Myanmar population and Housing Census, the total population is 314,093 people. It includes 152,940 males and 161,153 females. In the urban area, the total population is 43,030 people and 271,063 residents located in rural areas.

The total of employees were 12,326 people in 2013. The main earning of the villagers is land farming; about 8,059 of households (nearly 44%) involve in the agricultural sector. Therefore, agricultural sector is an important sector of the Maupin Township. The main cultivated crop is paddy of which the total covered areas is 40,455 acres. There are 93 school and these school are 8 high schools, 9 middle schools and 76 primary schools in Maubin Township.

### 3.3.3 Economic Background of Maubin Township

Almost, 60% of the population of Maubin Township are farmers, fisheries and local traders. The most important township product is rice. There are 40-455 acres of paddy field, cultivated and produced the total output of 2520346 bushels in 2016. The rice is refined and polished into white seed and traders purchase and transport the refined rice to Yangon which is the economic centre and the shipment port outlet. The

famous rice species cultivated in Maubin Township are general specie of short term harvested items, like Kauk-Thwae, Sinn-Thuha, Manaw-Thukha, etc.

Farmers of Maubin Township own paddy lands ranging from 1 to 30 acres and the average owned land is 15 acres with minimum yield of 40 bushels and maximum is 80 bushels with the average yield of 60 bushels. The cultivation frequency per year is once a year in rainy season. No Summer cultivation of rice but instead the farmers grow ground nuts, beams and seasonal vegetables which are transported to Yangon Market.

Maubin Township is also well-known in the production of dried salted fish, dried prawn, prawn paste as dry marine products. Some other products are family scale cottage industries based on fish and prawn products like fermented fish and prawn and prawn extracted oil, etc.

Most of the products mainly rice and marine products are transported to Yangon by the local traders for export purpose or local consumption. For fast and early product arrival, there are four prominent RC bridges namely, Maubin Bridge, Khattiya Bridge, Panntanaw Bridge and Bo Myat Htun Bridge, on the transportation way to Yangon.

Agricultural, manufacturing and commerce are the main economic activities within the Township. Rice growing and fishing are the major contributors to the economy. It is developing town with growing transportation and communication services. Main occupations are mostly workers, private employees and public employees. On the other hand, agriculture is the main economic activity of the Maubin Township. Mostly all of the farm lands in Maubin townships are rice fields though some small areas may be farms for vegetable and other food species.

## 3.4    Financial Institutions in Maubin Township

There are two State owned bank in Maubin Township such as Commercial Bank and Myanmar Agriculture Development Bank (MADB). Other financial institution is Cooperative Associations, Ministry of Agriculture, Livestock, and Irrigation and Department of Rural Development, NGO Organization, Microfinance Co., Ltd and other private moneylenders, which are local brokers and relatives. Among them, agriculture credit institutions are MADB, Cooperative Associations, Ministry of Agriculture, Livestock, and Irrigation and Department of Rural Development and local NGO Organization.

*Myanma Agricultural Development Bank*

In Maubin Township, MADB started on July 1978. MADB offers the seasonal crop production loan and the term loan to farmers. Farmers have borrowed two type of Seasonal loan: monsoon loan and winter loan. Twenty-eight groups of villages are granted a total loan of K 2,463.78 million (monsoon loan K 21,285 million and winter loan K335.28 million) in 2014-2015. Seasonal loan is increased to K l,859.88 million in 2016-2017. Monsoon loan amount increased annually from 2014 to 2017. But winter loan decreased to Kl 1.76 million in 2015-2016 and in 2016-2017 increased to K 3.54 million (Branches of MADB, 2018).

To apply for a loan, farmers have to submit a loan application to the loan screening committee at the village level for approval. MADB requires farmers to have a good credit history, to join a group of 3-2 farmers to mutually guarantee their loans, and to submit the Farmer Registration Book issued by the village authorities. The book is required to verify the farmer's right over the land leased from the Government year by year; it could not be used as a guarantee. However, a new farm law was recently passed by the parliament under which farmers will be issued ownership certificates, which could be transferred and thus pledged as collateral. Issuing certificates is under way, and MADB will need to adapt its lending terms and conditions to these new circumstances.

Once the application is submitted to the loan screening committee at the village level, the committee reviews and approves all loan applications that meet the conditions. MADB's branch managers sign off the loan application after the committee's approval. MADB staff is not allowed to travel to the villages for loan operations; farmers must come the bank in town to take out and to repay loans, incurring in considerable travel related costs. Loan screening committees also help to ensure that farmers pay off their loans on due dates. They exert pressure on delinquent borrowers with the argument that if a single borrower fails to repay its loan, the entire village will not be able to borrow from MADB in the next season.

Since the committee takes on the credit decision and monitoring process, MADB virtually performs only an agent role by acting as a money distribution channel for the Government. In the event of default, all members in the group are liable for repayment. If the group cannot repay, MADB has to bear the resulting losses. The branch manager at the township level is held responsible for following up with the delinquent borrowers and guarantors (Branches of MADB, 2018).

### Rural Development Department

Livestock, Irrigation, and Rural Development Department under Ministry of Agriculture has operated Mya Sain Yaung Project in Shwegyin Township since the year 2014-2015. Mya Sein Yaung lends loan service to rural areas. According to the application of the organization, only organization members have to take loan by Mya Sein Yaung. The interest rate is from 6% to 18% per annual (Branches of Livestock and Irrigation and Rural Development Department in Maubin Township, 2018).

### Cooperative Associations

In Maubin Township, the Cooperatives lend loan with the government grant. It refers from Central Bank to Central Cooperative. Cooperatives have three programs including agriculture, promote of agrarian and provide seeds. Loan amount differs depending on saving amount and time of membership. Interest rate is 1.5 percent. Financial cooperatives collect the loan payments daily and the loan duration is 6 months (Cooperative Association in Maubin, 2018).

### Microfinance Institutions

There are two microfinance institutions in Maubin Township. They are a local NGO institution and a microfinance Co., Ltd. The NGO institution was established in 2012. It provides loan service to the group of villages and small business. Individual must join a group of five members and collectively guarantee each individual loan. Maximum loan amount is 500000 Kyats to individual. Its interest rate is 30% per year. Loans collect installment and loan duration is only five months. Government is granted a microfinance Co., Ltd on November 2015. It was established Maubin civilian. Firstly, it provide financial service to government employees in Maubin Township. The maximum loan amount of one government employee is 300,000 Kyats. Employees return 2.5% interest rate in one month and 10 month.

# CHAPTER IV

## ANALYSIS OF THE EFFECT OF CREDIT ACCESSIBILITY ON FARM PERFORMANCE

The chapter includes a brief background of the research area, the characteristics of the farmers, and available credit services in Maubin Township, both formal and informal. The different processes of obtaining loans with the existing formal credit services are also presented. Then the credit preferences of small farmers as well as the factors they considered in choosing their lenders are provided. The problems/difficulties encountered by the farmers in obtaining credit and some of their suggestions to improve their credit accessibility are presented and discussed in this chapter. This analysis is based on empirical data collected from five group of villages in Maubin Township. There are five main sections in this chapter. They are survey design, background characteristics of respondents, credit accessibility of farmers and farm performance.

## 4.1 Research Design

This study is credit accessibility of agricultural loan on farm performance in Maubin Township. There are (12) wards and (76) village tracts in Maubin Township. Among (76) village tracts in farming, five group of villages (10%) were randomly selected from Maubin Township. A total of households are 4,487 (Maletto), 2,750 (Let Kyar Gyi), 2,367 (Lay Ein Su), 1,926 (Shwe Taung Hmaw) and 1,693 (Yae Le Ka Lay) respectively. The major job of these five villages are cultivation of paddy in summer and monsoon. Among them total household, nearly 10% of borrowing farmers are randomly selected in five of villages. The breakdown of numbers of farmers along with sample sizes are described in Table (4.1).

**Table (4.1)    Sample Size of Respondents**

| Group of Village | Number of Farming Household | Number of Borrowing Farmer | Sample Size of Borrowing Farmer |
|---|---|---|---|
| Maletto | 4,487 | 3,724 | 37 |
| Let Kyar Gyi | 2,750 | 2,283 | 23 |
| Lay Ein Su | 2,367 | 1,965 | 20 |
| Shwe Taung Hmaw | 1,926 | 1,599 | 16 |
| Yae Le Ka Lay | 1,693 | 1,405 | 14 |
| **Total** | **13,223** | **10,976** | **110** |

Source: Survey Data, 2018

### 4.2 Demographic Factors of Farm Performance

Demographic characteristics of respondents are firstly analyzed. They are gender, age and number of farmers. The following shows in Table (4.2).

**Table (4.2)   Demographic Factor of Farm Performance**

| Factor | Number | Percent |
|---|---|---|
| **Gender** | | |
| Male | 73 | 66 |
| Female | 37 | 34 |
| **Total** | **110** | **100** |
| **Age (Year)** | | |
| 35-44 | 34 | 31 |
| 45-54 | 62 | 56 |
| 55-64 | 14 | 13 |
| **Total** | **110** | **100** |
| **No. of Farmer** | | |
| 1 | 39 | 35 |
| 2 | 56 | 51 |
| 3 | 14 | 13 |
| 4 | 1 | 1 |
| **Total** | **110** | **100** |

Source: Survey Data, 2018

According to Table (4.2), the gender ratio of loan borrowers is 66:34. The age distribution of most borrowing farmers is from 45 to54 years as more than half of total respondents. The age distribution of second highest borrowing farmers is from 35 to 44 years as nearly 30 percent of total respondents. Regarding the education, all the respondents are literate, of which nearly two-third of farmers are with middle education level. For household size, 67 percent of the household size of the loan-borrowing farmers is 2 to 4 family members and nearly one-third of the borrowing farmers have 5 to 7 family members. The farmer distribution is two farmers per household on average.

### 4.3 Credit Accessibility of Farm Performance

This analysis of the credit accessibility for borrowing farmers includes sources of finance, amount of loan borrowed, duration of loan received from MADB, loan coverage percent and constraints for agricultural credit.

### 4.3.1 Sources of Funds

In the study area, farmers may borrow from various finance institutions. These are MADB, Cooperatives, Mya Sein Yaung Project and friend and relatives. The situation is showed in Table (4.3).

**Table (4.3)    Sources of Funds**

| Sources of Funds | Borrowers | |
|---|---|---|
| | **Number** | **Percent** |
| **Institutional Credit** | | |
| MADB | 110 | 100 |
| Cooperatives / MFI | 36 | 40 |
| **Non-Institutional Credit** | | |
| Mya Sein Yaung Project | 23 | 26 |
| Friend and Relative | 6 | 7 |

Source: Survey Data, 2018

According to Table (4.3), all borrowing farmers borrowed from MADB. Among other sources of finance, cooperatives are the second sources of finance for farmers. Moreover, over one-fourth of respondents borrowed from Mya Sein Yaung Project. At least, farmers borrowed from their friends and relatives. Almost all of farmer rely on MADB.

### 4.3.2 Amount of Loan Borrowed

In Maubin Township, there are five financial institutions. Mostly farmers borrowed from MADB and in addition, some of farmers borrowed loans from other organizations. MADB bank lends the seasonal loan at the minimum amount is 150,000 and the maximum amount is 2,250,000 for fifteen acres. The loan amount are divided into five groups. The loan amount depending on cultivated acres. Table (4.4) shows amount of loan received from MADB.

<p style="text-align:center">**Table (4.4)    Amount of MADB Loan Borrowed**</p>

| Paddy Cultivated Acres | Loan Amount (000' Kyat) | Number | Percent |
|---|---|---|---|
| 1-3 | 150-450 | 55 | 50 |
| 4-6 | 600-900 | 33 | 30 |
| 7-9 | 1,050-1,350 | 10 | 9 |
| 10-12 | 1,500-1,800 | 7 | 7 |
| 13-15 | 1,950-2,250 | 5 | 4 |
| **Total** | | **110** | **100** |

Source: Survey Data, 2018

According to the survey data, half of borrowing farmers from one to three cultivated acres borrows 150,000 to 450,000 kyats. One third of farmers from four to six acres borrow 600,000 to 900,000 kyats which amount is the second highest percent. At least, ten to twelve cultivated acres is nearly 4%. MADB loan interest rate is 8% per year. Other sources of finance include cooperatives, loans from Mya Sein Yaung Project and credits from friend and relatives. The smallest amount is Kyats 50,000 and the highest amount is Kyats 300,000. Table (4.5) shows amount of loan received from other organizations.

<p style="text-align:center">**Table (4.5)    Amount of Loan Borrowed from Other Sources**</p>

| Loan Amount (000' Kyat) | Number | Percent |
|---|---|---|
| 50 | 3 | 4 |
| 100 | 5 | 8 |
| 120 | 3 | 5 |
| 150 | 3 | 5 |
| 180 | 13 | 20 |
| 200 | 3 | 5 |
| 220 | 3 | 5 |
| 250 | 26 | 40 |
| 300 | 6 | 8 |
| **Total** | **65** | **100** |

Source: Survey Data, 2018

According to survey research, nearly one-third of farmers did not borrow from other organizations. Over two-third of respondents borrowed from other organizations. Average lending amount is 205,538 kyat of borrowing farmers. Other organizations loan interest rates are 18%, 24%, 30% and 36% respectively. Other organization loan interest rate is greater than MADB.

### 4.3.3 Duration of Loan Period from MADB

This analysis of farmer respondents answered duration of loan period from MADB. These answers are 3 months, 6 months during farming period and 12 months. It shows in Table (4.6).

**Table (4.6)    Duration of MADB Loan Period**

| Duration of Loan Period | Number | Percent |
|:---:|:---:|:---:|
| 3 Months | 11 | 10 |
| 6 Months | 15 | 13 |
| 12 Months | 84 | 77 |
| **Total** | **110** | **100** |

Source: Survey Data, 2018

According to Table (4.6), more than 75 percent of respondents replied one years (12 months) as the duration they received loans from MADB. About 13 percent of respondents answered that farming period (6 months) for duration of loan received from MADB. Only 10 percent of respondents stated the duration of loan as 3 months.

### 4.3.4 Loan Coverage Percent

All farmers answered that the amount of MADB loan do not fully cover their farming. The following Table show their loan coverage percent of respondents. A large number of farmers used loans more in farming. Small numbers of respondents used loan for machinery.

**Table (4.7)    Loan Coverage Percent**

| Loan Coverage Percent | Number | Percent |
|:---:|:---:|:---:|
| 30 | 5 | 4 |
| 40 | 10 | 9 |
| 50 | 44 | 40 |
| 60 | 15 | 14 |
| 70 | 36 | 33 |
| **Total** | **110** | **100** |

Source: Survey Data, 2018

Table (4.7) shows that 40 percent of respondents answered 50 percent sufficiency. It is followed by one-third of respondents covered 70 percent. At least, nearly 5 percent of respondents answered 30 percent. The sufficient percent is at its highest of 70%.

## 4.4 Farm Characteristic of Farm Performance

This analysis of the other factor for borrowing farmers includes farming experience, paddy cultivated acres and property ownership.

### 4.4.1 Farming Experience

Almost all farmer respondents have extensive farming experience in their lifetime. The least experience farmers have less than ten year farming experience and the most experienced farmers have 31 to 40 years of farming as show in Table (4.8).

Table (4.8)     Farming Experience

| Farming Experience (Year) | Number | Percent |
|:---:|:---:|:---:|
| <10 | 16 | 15 |
| 11-20 | 53 | 48 |
| 21-30 | 35 | 32 |
| 31-40 | 6 | 5 |
| **Total** | **110** | **100** |

Source: Survey Data, 2018

Half of borrower's farming year is within the year of 11 to 20. Moreover, one third of borrowing farmers are within the farming year of 21 to 30. From less than 10 and 31 to 40 years of farming is the small percent of respondents.

### 4.4.2 Paddy Cultivated Acres

Almost all farmer respondents are small-cultivated acres. The smallest ownership acres of farmers are 1 acre and the largest is 15 acres as show in Table (4.9).

**Table (4.9)    Paddy Cultivated Acres**

| Paddy Cultivated Acres | Borrowers | |
| --- | --- | --- |
| | **Number** | **Percent** |
| 1-3 | 59 | 54 |
| 4-6 | 31 | 28 |
| 7-9 | 10 | 9 |
| 10-12 | 6 | 5 |
| 13-15 | 4 | 4 |
| **Total** | **110** | **100** |

Source: Survey Data, 2018

Table (4.9) shows that more than half of borrowing farmers cultivated 1 to 3 acres of paddy. Among the remaining borrowing farmers, four farmers of 13 to 15 cultivated acres is the smallest percent as 4% of respondents and nearly one-third of borrowing farmers responded of 4 to 6 cultivated acres.

### 4.4.3  Property Ownership

Types of property ownership are classified as living ownership and business ownership. Living ownership include home, cycle, bicycle, water-pump and TV. Farming ownership contains farmland, cows, bullock cart, ploughing machine and water pump. The data are shown in Table (4.10).

**Table (4.10)   Property Ownership**

| Farming Properties | Borrowers | |
| --- | --- | --- |
| | **Number** | **Percent** |
| Farmland | 110 | 100 |
| Cows | 75 | 68 |
| Bullock Cart | 72 | 65 |
| Ploughing Machine | 22 | 20 |
| Water Pump | 26 | 24 |

Source: Survey Data, 2018

According to Table (4.10), all borrowing farmers have their own farmlands. Borrowing farmers own cows as 68 percent of respondents, bullock cart as 65 percent of respondents, ploughing machine as 20 percent of respondents and water pump as 24 percent.

**4.5    Analysis of Farm Performance Towards Paddy Yield per Acre**

This section pinpoints the analysis of paddy yield per acre of farmers. Paddy yield per acre of respondents are within the range between 40 to 80 bushels. Table (4.11) shows paddy yield per acre of respondents.

**Table (4.11)    Paddy Yield per Acre**

| Paddy Yield per Acre | Borrowers | |
|:---:|:---:|:---:|
| | **Number** | **Percent** |
| 40 | 5 | 5 |
| 45 | 8 | 7 |
| 50 | 14 | 13 |
| 55 | 11 | 10 |
| 60 | 23 | 21 |
| 65 | 19 | 17 |
| 70 | 11 | 10 |
| 75 | 10 | 9 |
| 80 | 9 | 8 |
| **Total** | **110** | **100** |

Source: Survey Data, 2018

It shows that paddy yield per acre of borrowing farmers produced within the range between 45 to 80 bushels and non-borrowing farmers produced within the range between 40 to 55 bushels.

The majority of borrowing farmers produce 60 bushels per acre and non-borrowing fanners produce 50 bushels per acre. Therefore, the result of the analysis is that loan borrowing farmer yield per acre more than non-borrowing farmers.

**4.5.1    Effect of Demographic Factor on Paddy Yield per Acre**

In this study analyzes the effect of demographic factor on paddy yield per acres, the multiple linear regression model is applied to this study. The dependent variable is paddy yield per acre and independent variables are gender, age and number of farmers in household.

**Table (4.12)   Effect of Demographic Factor on Paddy Yield per Acre**

| Variables | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 6.811 | 0.293 | | 23.486 | .000 |
| Gender | 4.933 | 1.536 | .217 | 3.211 | .002 |
| Age | .349 | .140 | .178 | 2.488 | .014 |
| No. of Farmer in Household | 11.139 | .1.116 | .716 | 6.651 | .000 |
| Adjusted $R^2$ | .501 | | | | |
| F Value | 37.493 (P value = .000) | | | | |

Source: Survey Result 2018

In Table (4.12), gender variable is significant at 1% level since the resulted p value are less than 0.01. The regression coefficient of gender is 4.933 at 1% significance level. Therefore, it can be concluded that, age and number of farmer in household hold constant, males will more produced about 4.933 bushels per acres will increases paddy productivity.

The results show that the age of farmer variable is significant at 5% level since the resulted p value is less than 0.05. The regression coefficient of age of farmer is .349 at 5% significance level. Thus, the increases of age of farmer by one year, paddy productivity will increases by 0.349 bushels, while other variables are remained constant.

Number of farmer in household variable is significant at 1% level since the resulted p value are less than 0.01. The regression coefficient of number of farmer in household is 11.139 at 1% significance level. If the number of farmer increases in one farmer, paddy productivity will increases 11.1 bushels, while other variables are remained constant.

The performance of the regression model, the value of adjusted $R^2$ is 0.501 that revels 50.1% of total variation in paddy yield per acre are explained by three factors:, gender, age and number of farmers in household. The value of F=37.493 is significant at P=0.000<0.05.Thus, the regression model is statistically significant at 1% level with paddy yield per acre.

### 4.5.2 Effect of Credit Accessibility on Paddy Yield per Acre

In this study analyzes the effect of credit accessibility on paddy yield per acres, the multiple linear regression model is applied to this study. The dependent variable is paddy yield per acre and independent variables are number of sources of funds, duration of loan period and loan coverage percent.

**Table (4.13)   Effect of Credit Accessibility on Paddy Yield per Acre**

| Variables | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 37.637 | 4.817 | | 7.817 | .000 |
| Number of sources of funds | 1.401 | 1.265 | .105 | 1.107 | .071 |
| Duration of Loan Period (month) | 1.049 | .369 | .310 | 2.846 | .005 |
| Loan Coverage Percent | .187 | .093 | .201 | 2.014 | .047 |
| Adjusted $R^2$ | .216 | | | | |
| F Value | 11.021 (P value = .000) | | | | |

Source: Survey Result 2018

In Table (4.13) these results show that the number of sources of funds variable is significant at 10.1% level since the resulted p value is less than 0.10. The regression coefficient of number of sources of funds is 1.401 at 10.1% significance level. When the number of sources of funds increases in one unit, paddy productivity will increases 1.401 bushels, while other variables are remained constant.

Duration of loan period variable is significant at 1% level since the resulted p value are less than 0.01. The regression coefficient of duration of loan period is 1.049 at 1.1% significance level. If duration of loan period increases by one month, paddy productivity will increases by 1.049 bushels, while other variables are remained constant.

Loan coverage percent variable is significant at 5.1% level since the resulted p value are less than 0.05. The regression coefficient of loan coverage percent is 0.187 at 5.1% significance level. If loan coverage percent increases by one percent, paddy productivity will increases by 0.187 bushels, while other variables are remained constant.

The performance of the regression model, the value of adjusted $R^2$ is .216 that revels 21.6% of total variation in paddy yield per acre are explained by three factors:, number of sources of funds, duration of loan period and loan coverage percent. The value of F=11.021 is significant at P=0.000<0.05.Thus, the regression model is statistically significant at 1% level with paddy yield per acre.

### 4.5.3 Effect of Farm Characteristic on Paddy Yield per Acre

In this study analyzes the effect of credit accessibility on paddy yield per acres, the multiple linear regression model is applied to this study. The dependent variable is paddy yield per acre and independent variables are farming experience, paddy cultivated acres and number of property ownership.

**Table (4.14)   Effect of Farm Characteristic on Paddy Yield per Acre**

| Variables | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 35.356 | 1.880 | | 18.809 | .000 |
| Farming Experience (year) | .623 | .109 | .441 | 5.737 | .000 |
| Paddy Cultivated Acres | -.027 | .292 | -.008 | -.093 | .926 |
| No. of Property Ownership | 11.180 | 1.119 | .608 | 9.993 | .000 |
| Adjusted $R^2$ | .721 | | | | |
| F Value | 95.017 (P value = .000) | | | | |

Source: Survey Result 2018

In Table (4.14), these results show that the farming experience variable is significant at 1% level since the resulted p value is less than 0.01. The regression coefficient of farming experience is 0.623 at 1% significance level. When the increases of farming experience by one year, paddy productivity will increases by 0.623 bushels, while other variables are remained constant. Moreover, paddy cultivated acres variable is not significant since the resulted p value is greater than 0.10.

The number of property ownership variable is significant at 1% level since the resulted p value are less than 0.01. The regression coefficient of property ownership is

11.180 at 1% significance level. If the number of ownership property increases by one unit such as machinery, paddy productivity will increases by 11.180 bushels, while other variables are remained constant.

The performance of the regression model, the value of adjusted $R^2$ is .721 that revels 72.1% of total variation in paddy yield per acre are explained by three factors:, farming experience, paddy cultivated acres and property ownership. The value of F=95.017 is significant at P=0.000<0.05. Thus, the regression model is statistically significant at 1% level with paddy yield per acre.

## 4.6    Analysis of Farm Performance towards Annual Household Farm Income

Farmer's annual household income is between from 1500,000 to 6400,000 Kyat. The following table (4.15) shows the annual household income of the respondents.

### Table (4.15)   Annual Household Farm Income

| Annual Household Farm Income | Borrowers | |
| :---: | :---: | :---: |
| (Kyat Lakh) | Number | Percent |
| 15-24 | 43 | 39 |
| 25-34 | 43 | 39 |
| 35-44 | 18 | 16 |
| 45-54 | 4 | 4 |
| 55-64 | 2 | 2 |
| **Total** | **110** | **100** |

Source: Survey Data, 2018

According to table (4.15) annual household income of most borrowing farmers is from 2500,000 to 3400,000 kyats as over 40 percent of total respondents. Annual household income of borrowing farmers from 5500,000 and 6400,000 are the smallest percent.

### 4.6.1   Effect of Demographic Factor on Annual Household Farm Income

In this study analyzes the effect of demographic factor on annual household farm income, the multiple linear regression model is applied to this study. The dependent variable is annual household farm income and independent variables are gender, age and number of farmers in household.

**Table (4.16) Effect of Demographic Factor on Annual Household Farm Income**

| Variables | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 2096.750 | 430.752 | | 4.868 | .000 |
| Gender | 582.866 | 105.165 | .308 | 5.542 | .000 |
| Age | 7.921 | 9.608 | .048 | .824 | .412 |
| No. of Farmer in Household | 997.921 | 76.396 | .768 | 13.062 | .000 |
| Adjusted $R^2$ | .664 | | | | |
| F Value | 520.805 (P value = .000) | | | | |

Source: Survey Result 2018

In Table (4.16) these results show that the gender variable is significant at 1% level since the resulted p value are less than 0.01. The regression coefficient of gender is 582.866 at 1% significance level. Therefore, it can be concluded that, age and number of farmer in household hold constant, males will more produced about 583 thousand kyats farm income will increases.

Age of farmer variable is not significant at 10% level since the resulted p value is greater than 0.10. The regression coefficient of age of farmer is 7.921 at 10% not significance level. If the increases of age of farmer by one year, annual household farm income will increases by 7.291 thousand kyats, while other variables are remained constant.

Number of farmer in household variable is significant at 1% level since the resulted p value is less than 0.01. The regression coefficient of number of farmer in household is 997.921 at 1% significance level. If the number of farmer increases in one unit, annual household farm income will increases 997.921 thousand kyats, while other variables are remained constant.

The performance of the regression model, the value of adjusted $R^2$ is 0.664 that revels 66.4% of total variation in annual household farm income are explained by three factors:, gender, age and number of farmers in household. The value of F=520.805 is significant at P=0.000<0.05.Thus, the regression model is statistically significant at 1% level with annual household farm income.

### 4.6.2 Effect of Credit Accessibility on Annual Household Farm Income

In this study analyzes the effect of credit accessibility on annual household farm income, the multiple linear regression model is applied to this study. The dependent variable is annual household farm income and independent variables are number of sources of funds, duration of loan period and loan coverage percent.

**Table (4.17)   Effect of Credit Accessibility on Annual Household Farm Income**

| Variables | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 769.049 | 386.902 | | 1.988 | .049 |
| Number of sources of funds | 212.354 | 101.599 | .190 | 2.090 | .039 |
| Duration of Loan Period (month) | 62.696 | 29.610 | .222 | 2.117 | .037 |
| Loan Coverage Percent | 24.488 | 7.478 | .315 | 3.275 | .001 |
| Adjusted $R^2$ | .273 | | | | |
| F Value | 14.669 (P value = .000) | | | | |

Source: Survey Result 2018

In Table (4.17), these results show that the number of sources of funds variable is significant at 5% level since the resulted p value is less than 0.05. The regression coefficient of number of sources of funds is 212.354 at 5% significance level. If the number of sources of funds are increases by one unit, annual household farm income will increases by 212.354 kyat in thousand, while other variables are remained constant.

Duration of loan period variable is significant at 5% level since the resulted p value is less than 0.05. The regression coefficient of duration of loan period is 62.696 at 5% significance level. If duration of loan increases by one month, annual household farm income will increases by 62.696 kyats in thousand, while other variables are remained constant.

Loan coverage percent variable is significant at 1% level since the resulted p value is less than 0.01. The regression coefficient of loan coverage percent is 24.488 at 1.1% significance level. If loan coverage percent increases by one percent, annual

household farm income will increases by 24.448 kyats in thousand, while other variables are remained constant.

The performance of the regression model, the value of adjusted $R^2$ is 0.273 that revels 27.3% of total variation in annual household farm income are explained by three factors:, number of sources of funds, duration of loan period and loan coverage percent. The value of F=14.669 is significant at P=0.000<0.05.Thus, the regression model is statistically significant at 1% level with annual household farm income.

### 4.6.3 Effect of Farm Characteristic on Annual Household Farm Income

In this study analyzes the effect of farm characteristic on annual household farm income, the multiple linear regression model is applied to this study. The dependent variable is annual household farm income and independent variables are farming experience, paddy cultivated acres and number of property ownership.

**Table (4.18)   Effect of Farm Characteristic on Annual Household Farm Income**

| Variables | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| Constant | 1062.060 | 141.593 | | 7.501 | .000 |
| Farming Experience (year) | 39.624 | 8.174 | .336 | 4.848 | .000 |
| Paddy Cultivated Acres | 72.991 | 22.022 | .259 | 3.315 | .001 |
| No. of Property Ownership | 733.086 | 84.274 | .478 | 8.699 | .000 |
| Adjusted $R^2$ | .773 | | | | |
| F Value | 124.549 (P value = .000) | | | | |

Source: Survey Result 2018

In Table (4.18), these results show that the farming experience variable is significant at 1% level since the resulted p value is less than 0.01. The regression coefficient of farming experience is 39.624 at 1% significance level. If the farming experience are increases by one year, annual household farm income will increases by 39.624 kyats in thousand, while other variables are remained constant.

Cultivated acre variable is significant at 1% level since the resulted p value is less than 0.01. The regression coefficient of paddy cultivated acre is 72.991 at 1% significant level. If the paddy cultivated acre are increases by one acre, annual

household farm income will increases by 72.991 kyats in thousand, while other variables are remained constant.

The number of ownership property variable is significant at 1% level since the resulted p value are less than 0.01. The regression coefficient of number of property ownership is 733.086 at 1% significance level. If the number of ownership property increases by one unit such as machinery, the annual household farm income will increases by 733.066 kyats in thousand, while other variables are remained constant.

The performance of the regression model, the value of adjusted $R^2$ is .773 that revels 77.3% of total variation in annual household farm income are explained by three factors:, farming experience, paddy cultivated acres and number of property ownership. The value of F=124.549 is significant at P=0.000<0.05. Thus, the regression model is statistically significant at 1% level with annual household farm income.

# CHAPTER V
# CONCLUSION

This chapter describes conclusion of the study areas of credit accessibility and effect of agricultural loan among farmers. This chapter contains findings and recommendations and needs for further research of the study.

## 5.1    Findings

Myanmar is agriculture-based country. Agriculture plays an important role in reducing poverty in Myanmar. The agricultural sector of the country accounts for 38 percent of national GDP and 23 percent of exports in. fiscal year 2016-2017. Therefore, agricultural loan has always been an important factor in improving agricultural productivity and strengthening the rural economy. MADB provide agricultural loan of K 1,630,623.38 million to farmers for monsoon, winter and pre-monsoon in 2016-2017. Development loan has issued 3,613.52 million in 2016-2017. Along with the MADB' s objectives, the operational guidelines are set out to provide adequate supply of credit to the client, to provide credit timely, to seek full recovery of loans, to enable farmers for  investment  through  saving, to help to become debt-free farmers and to make bank self-replying.

According to the study, on demographic characteristics of respondents, the most of farmers fall within the age level 45 to 54 years old. More than half of farmers are middle education level. The household size of the respondents is from two to seven members. Average numbers of farmers is two farmers. Duration of farming experience is from 11 to 20 years and their main source of earning is farming. Their living standard is above average level having owned home, motorcycle and almost they owned farmland and cows. The cultivated acre is fifteen acres at maximum and one acre at minimum. Average paddy yield per acre is round about 60 bushels per acre.

Regarding with credit accessibility, all loan borrower farmers have saving deposit at MADB, but not all non-borrower farmers have saving account with MADB. The maximum year the loan borrower farmers connect with the bank is 30 years and the minimum year is 1 year. Then, 90 of loan borrower farmer's main source of finance are MADB. The amount of loan given by MADB depends on the cultivate acre that the borrower farmer have. All farmers answered not sufficient loan amount

from financial organization. Almost of respondent replied loan received after farming from MADB (Post-Farming). Most of the loan borrower farmers replied that it is easy to get loan and 20 percent of respondents answered that it is difficult to get loan. All farmers wait half of day to get loan. In these study areas, nine miles is the greatest distance from group of villages to MADB.

According to t-test, loan-borrowing farmer's paddy yield per acre, farming income and annual household income is greater than those of non-borrowing farmers. According to multiple regression analysis, number of cows, ownership of water-pump, loan coverage percent and duration of loan period is statistically significant with paddy yield per acre. The effect of duration of loan period is highest among variables on paddy yield per acres.

## 5.2    Recommendations

In the selected study area, according to MADB, all borrower farmers will get their respective loan for next farming season only when each borrower member of the village repays the loan the get before. That is why, not all farmers get loan in time from MADB because some borrowers are often late to repay their loan. Even though some borrowers repay their loan in time, they will not be able to get their loan if one of the borrower members of the village repay lately. Thus, this credit system has a fundamental weakness. Farmers who do not have their own farmland do not get loan from some organization. Therefore, they do not use adequate quality seeds, reliable fertilizer and pesticides, etc. Financial organization should assist to improve their social-economic. A few farmers find it difficult getting credit from some organization. This procedure should be simplified and made farmer friendly.

MADB does not provide sufficient amount of loan for farmers. The full amount of loans needed by the farmers for paddy plantation should be provided as much as possible based on MADB's working capital. In agricultural finance, the cooperative of private banks are required. Therefore, agriculture sector should support both public and private organization to get sufficient amount of loan for farmers.

Nowadays, Myanmar agriculture sector needs the knowledge and infrastructure especially in the rural areas. Farmer need to know modem farming technique and information on the global supply and demand conditions. The government should instruct modem agricultural techniques, support modem

agricultural machine to rural farmers. The government should encourage participation and provide incentives for farmers to save and recycle the funds.

## 5.3    Areas for Further Research

This study only focused on credit accessibility and effect of agricultural loan in Maubin Township. The study area covers Maubin Township only. Thus, the result for the study may not reflect the overall situation in Myanmar.  Only paddy crops have been taken in to consideration. This research cannot be specifically explored farmer's loan usage for farming. Prices of paddy product and their benefits are lacking in this study. It is due to time constraints to conduct more area in survey as well as to collect more randomly selected farmers. Comparing loan borrower farmers and loan non-borrower farmers are difference sample size because of loan non-borrower farmer population is very small in Maubin Township. Therefore, if further study can be conducted on more sample size and whole Myanmar areas.

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# APPENDIX

## Questionnaire for Effect of Credit accessibility on Farm Performance in Maubin Township

Interviewer -----------

Village Name -----------

Date of interview -------------

**A . Respondent Profile**

1 . Name of Respondent----------------------(Gender -------------- Age

Education -----------------------------------------Occupation)

2 . Name of Household Head-------------- (Gender ----------- Age-------

Education ------------------ Occupation --------- )

3. Total no. of Household (----) No. of workers------- No. of Dependent-----

4. Job condition of the family member

No. of farmers --------------No. of government staff-- -------------

No. of shopkeepers-------------- No. of general worker----------------

5(a).Farm Tenure Status (only one descried one trick)

(1) Owner (2) Share Tenant  (3) Lease Holder  (4) Other(please specify

(b). How many years in farming?

**B . Income Condition**

1. Main source of earning for living        (only describe one tick)

(1) Farming (2) Small Shop (3) Government Employee (4) Private Employee

(5) Other (please specify ---- )

2. Average annual household income ----------Kyats

3. Please proportion of the farming income

Farm income ratio ( )  Non-farm income ratio (  )

(1) Crops  (  )

(2) Livestock  (  )

(3) Farm labor  (  )

Non-Farm

-Income from other agricultural activities
      (1)  Rice/Groundnut milling  (  )
      (2)  Rental /labor for pre/pos t-harvest facilities  (  )
      (3)  Other(Please specify ----------------)  (  )

- Income from non- agricultural activities
      (1) Small business  (  )
      (2) Government employee  (  )
      (3)  Private employee  (  )
      (4) Remittances from abroad  (  )
      (5) Other (please specify------------ )

**B.**  **Property of ownership C. Property of ownership**

1. Ownership in home

| No | Item | Have you own the property? **1**= yes; 2=no | Type | Quantity | Value (Market Price) |
|---|---|---|---|---|---|
| I | Living House | | | | |
| 2 | Motorcar | | | | |
| 3 | Motorcycle | | | | |
| 4 | Bicycle | | | | |
| 5 | Water Pump | | | | |
| 6 | TV | | | | |
| 7 | Trolley | | | | |
| 8 | Other | | | | |

Type: House (I) Brick-noggin (2) Bamboo (3) Wooden (4) 0ther (Please specify)

2.        Ownership for Farming and Other Business

| No | Item | Have you own the prope1ty? l=Yes: 2=No | Type | Quantity | Value (market Price) |
|---|---|---|---|---|---|
| 1 | Farmland | | | | |
| 2 | Cows | | | | |
| 3 | Bullock Cark | | | | |
| 4 | Ploughing Machine | | | | |
| 5 | Other Agricultural Machine/ Tools | | | | |
| 6 | Water Pump | | | | |
| 7 | Trolley | | | | |
| 8 | Mill | | | | |
| 9 | Shop | | | | |
| 10 | Others | | | | |

**D.1 Farm Condition**

| No | Group of village name | Owned land (acre) | Cultivate land (acre) |
|---|---|---|---|
| 1 | Tadhuntile | | |
| 2 | Taundbed | | |
| 3 | Than Zeik Min Lan | | |

2. Yield per acre this year

| No | Season | Other Crop | Cultivate | Yield Pr acre | Total Yield (in unit) | Selling Price Per unit | Remark |
|---|---|---|---|---|---|---|---|
| 1 | Rainy | | | | | | |
| 2 | Cold | | | | | | |
| .) | Summer | | | | | | |

### 3. Farming input used for cultivation (per acre)

| No | Item | Unit used per acre | Quantity | Price per unit | Remark |
|----|------|------|------|------|------|
| 1 | Seed | | | | |
| 2 | Pesticides | | | | |
| :') | Natural Fertilizer | | | | |
| 4 | Chemical Fertilizer | | | | |
| 5 | Others | | | | |

### 4. Number of labor working in the farm (per acre)

| No | Types of farm work | No. of farm workers | Number of Days | Wages Per Day | Remark |
|----|------|------|------|------|------|
| 1 | Ploughing | | | | |
| 2 | Putting seed | | | | |
| :') | Taking plant | | | | |
| 4 | Growing plant | | | | |
| 5 | Harvesting | | | | |

### E. Farmer's connect with Bank

Do you have saving account in MADB? (Yes=l, No=0) ---------

Period of content with MADB (Year/Month) --------

For **Loan Borrowing Farmers**

## I. Loan Condition

1. Where do you bonow from loan?

   (a) MADB (b) Cooperative (c) Microfinance (c) friend and relative (c) other(---)

2. Where do you know loan information?

   (a) Village administer (b) Bank staff (c) friend and relative (d) other(   )

## II. Source of Loan  from MADB

   If you borrowed or yes,

   (1). Frequency of borrowing  --------------

   (2). Amount loan-----(Kyat)

   (3). Extent of sufficiency (%) ------------

   (4). Type of loan (short/long)      -

   (5). Interest rate -----------------

   (6). Do you give collateral? (Yes=l, No=2)       -

   (7). Type of collateral -----------------

   (8). Duration of loan Period (Month) ---------------

   (9). Repayment (Installment/lump sum)    -

   (10). Period of loan received

       (l) Before farming (2) Farming the period (3) After farming

   (11). Main use of loan

   For agriculture percent ( ) For machinery percent ( )

| No | Item | Rank |
|----|------|------|
| 1 | Seed | |
| 2 | Pesticides | |
| 3 | Fertilizers | |
| 4 | Labor | |
| 5 | Farm Machinery | |
| 6 | Water-pump machine | |
| 7 | Other | |

**Submission for Loan Application of MADB**

(1)    Do you take that borrow ofloan is difficult? (Yes=l, No=2)

(2)    Waiting time to get loan (day/ month)

(3)    Do you get timing ofloan? (Yes=l, No=O)

(4)    Distance of MADB (Km/mile)

(5)    Travelling period-----------

(6)    Cost of travelling to MADB---------

**Loan from other Sources**

(1)    Do you borrow loan other financial institution? (Yes=l, No=O) ---------

(2)    Frequency of borrowing --------------

(3)    Amount loan --------------------------------(Kyat)

(4)    Extent of sufficiency (%) ---------------

(5)    Type of loan ---------------

(6)    Interest rate- - - - - - - - - - -

(7)    Do you give collateral?  (Yes= l, No=2)--------------

(8)    Type of collateral -----------------

(9)    Tenure of loan (Year/Month) ---------------

Repayment (Installment/lump sum)  --------------

## I. Regression Model of Yield on Demographic Factor

**Variables Entered/Removed<sup>a</sup>**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | No. of Farmer, Gender, Age[b] | . | Enter |

a. Dependent Variable: Yield
b. All requested variables entered.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .718[a] | .515 | .501 | 7.608 |

a. Predictors: (Constant), No. of Farmer, Gender, Age

**ANOVA<sup>a</sup>**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 6510.673 | 3 | 2170.224 | 37.493 | .000[b] |
| | Residual | 6135.690 | 106 | 57.884 | | |
| | Total | 12646.364 | 109 | | | |

a. Dependent Variable: Yield
b. Predictors: (Constant), No. of Farmer, Gender, Age

**Coefficients<sup>a</sup>**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 6.811 | 0.293 | | 9.664 | .000 |
| | Gender | 4.933 | 1.536 | .217 | 3.211 | .002 |
| | Age | .349 | .140 | .178 | 2.488 | .014 |
| | No. of Farmer | 11.139 | 1.116 | .716 | 9.981 | .000 |

a. Dependent Variable: Yield

## II. Regression Model of Income on Demographic Factor

**Variables Entered/Removed<sup>a</sup>**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | No. of Farmer, Gender, Age[b] | . | Enter |

a. Dependent Variable: Income
b. All requested variables entered.

## Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .821[a] | .673 | .664 | 520.805 |

a. Predictors: (Constant), No. of Farmer, Gender, Age

## ANOVA[a]

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| | Regression | 59266971.743 | 3 | 19755657.248 | 72.835 | .000[b] |
| 1 | Residual | 28751210.076 | 106 | 271237.831 | | |
| | Total | 88018181.818 | 109 | | | |

a. Dependent Variable: Income

b. Predictors: (Constant), No. of Farmer, Gender, Age

## Coefficients[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| | (Constant) | 2096.750 | 430.752 | | 4.868 | .000 |
| | Gender | 582.866 | 105.165 | .308 | 5.542 | .000 |
| 1 | Age | 7.921 | 9.608 | .048 | .824 | .412 |
| | No. of Farmer | 997.921 | 76.396 | .768 | 13.062 | .000 |

a. Dependent Variable: Income

## III. Regression Model of Yield on Credit Accessibility

### Variables Entered/Removed[a]

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | Loan Coverage, Number of sources, Duration of Loan[b] | . | Enter |

a. Dependent Variable: Yield

b. All requested variables entered.

### Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .488[a] | .238 | .216 | 9.536 |

a. Predictors: (Constant), Loan Coverage, Number of sources, Duration of Loan

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 3006.760 | 3 | 1002.253 | 11.021 | .000[b] |
| | Residual | 9639.604 | 106 | 90.940 | | |
| | Total | 12646.364 | 109 | | | |

a. Dependent Variable: Yield

b. Predictors: (Constant), Loan Coverage, Number of sources, Duration of Loan

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 37.637 | 4.817 | | 7.814 | .000 |
| | Number of sources | 1.401 | 1.265 | .105 | 1.107 | .071 |
| | Duration of Loan | 1.049 | .369 | .310 | 2.846 | .005 |
| | Loan Coverage | .187 | .093 | .201 | 2.014 | .047 |

a. Dependent Variable: Yield

## IV. Regression Model of Income on Credit Accessibility

**Variables Entered/Removed[a]**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | Loan Coverage, Number of sources, Duration of Loan[b] | . | Enter |

a. Dependent Variable: Income

b. All requested variables entered.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .542[a] | .293 | .273 | 766.000 |

a. Predictors: (Constant), Loan Coverage, Number of sources, Duration of Loan

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 25822051.643 | 3 | 8607350.548 | 14.669 | .000[b] |
| | Residual | 62196130.175 | 106 | 586755.945 | | |
| | Total | 88018181.818 | 109 | | | |

a. Dependent Variable: Income

b. Predictors: (Constant), Loan Coverage, Number of sources, Duration of Loan

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 769.049 | 386.902 | | 1.988 | .049 |
| | Number of sources | 212.354 | 101.599 | .190 | 2.090 | .039 |
| | Duration of Loan | 62.696 | 29.610 | .222 | 2.117 | .037 |
| | Loan Coverage | 24.488 | 7.478 | .315 | 3.275 | .001 |

a. Dependent Variable: Income

## V.     Regression Model of Yield on Other

**Variables Entered/Removed[a]**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | Ownership , Farming Experience, Paddy Cultivated Acres[b] | . | Enter |

a. Dependent Variable: Yield
b. All requested variables entered.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .854[a] | .729 | .721 | 5.687 |

a. Predictors: (Constant), Ownership , Farming
Experience, Paddy Cultivated Acres

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 9218.374 | 3 | 3072.791 | 95.017 | .000[b] |
| | Residual | 3427.989 | 106 | 32.340 | | |
| | Total | 12646.364 | 109 | | | |

a. Dependent Variable: Yield
b.  Predictors: (Constant), Ownership , Farming Experience, Paddy Cultivated
   Acres

ANOVA

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 35.356 | 1.880 | | 18.809 | .000 |
| | Farming Experience | .623 | .109 | .441 | 5.737 | .000 |
| | Paddy Cultivated Acres | -.027 | .292 | -.008 | -.093 | .926 |
| | Ownership | 11.180 | 1.119 | .608 | 9.993 | .000 |

a. Dependent Variable: Yield

## VI.　　Regression Model of Income on Other

**Variables Entered/Removed[a]**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | Ownership , Farming Experience, Paddy Cultivated Acres[b] | . | Enter |

a. Dependent Variable: Income
b. All requested variables entered.

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .883[a] | .779 | .773 | 428.376 |

a. Predictors: (Constant), Ownership , Farming Experience, Paddy Cultivated Acres

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 68566558.662 | 3 | 22855519.554 | 124.549 | .000[b] |
| | Residual | 19451623.156 | 106 | 183505.879 | | |
| | Total | 88018181.818 | 109 | | | |

a. Dependent Variable: Income
b. Predictors: (Constant), Ownership , Farming Experience, Paddy Cultivated Acres

**Coefficients<sup>a</sup>**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1062.060 | 141.593 | | 7.501 | .000 |
| | Farming Experience | 39.624 | 8.174 | .336 | 4.848 | .000 |
| | Paddy Cultivated Acres | 72.991 | 22.022 | .259 | 3.315 | .001 |
| | Ownership | 733.086 | 84.274 | .478 | 8.699 | .000 |

a. Dependent Variable: Income