

**YANGON UNIVERSITY OF ECONOMICS
DEPARTMENT OF DEVELOPMENT STUDIES PROGRAMME**

**THE ROLE OF AGRICULTURAL FINANCING IN
MYANMAR**

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EMDEVS -30 (15TH BATCH)**

OCTOBER, 2019

**THE ROLE OF AGRICULTURAL FINANCING
IN MYANMAR**

A thesis submitted in a partial fulfillment of the requirements for the degree of
master of development studies.

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MASTER OF DEVELOPMENT STUDIES PROGRAMME

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ABSTRACT

Agricultural financing plays an important role in increasing agricultural productivity in developing countries such as Myanmar. Access to financing is a great challenge for most farmers. The lack of access to financing is an important barrier for farmers to improve the efficiency of their production. Therefore, it is necessary to promote the financing of agriculture to stimulate investment in the agricultural sector and increase food production. The main objective of the study is to analyze the relationship of agricultural financing on agriculture productivity in Myanmar. This study used qualitative method through both primary and secondary sources to analyze macroeconomic variable such as agricultural loans and agricultural productivity. Descriptive statistics was used to analyze the qualitative data while Pearson' correlation and regression were done to examine the relationship between the agricultural loan and agricultural production. This study found that when the amount of agricultural loan increases, the amount of agricultural production also increases. This study concluded that there is a positive relationship between agricultural loan and agricultural production but not very strong relationship. The study suggested on government should find potential options such as strengthen agricultural credit scheme and increase MFIs coverage to increase farmer accessible to agricultural loan for more agricultural productivity.

ACKNOWLEDGEMENTS

My sincere gratitude goes to the University of Yangon Economics for providing me with the wonderful opportunity to pursue the degree of Master of Development Studies and this thesis as a part of the study.

I would like to express my deep gratitude and thanks to Prof. Dr. Tin Win, Rector of Yangon University of Economics, Prof. Dr. Nilar Myint Htoo, Pro Rector of Yangon University of Economics, Prof. Dr. Cho Cho Thein, Programme Director of MDevS Programme and Head of Department of Economics, Yangon University of Economics, Prof. Dr. Tha Pye Nyo, Professor, Department of Economics, Yangon University of Economics, for their encouragement and guidance throughout the course of my study and valuable suggestions which led to completion of the study.

I would like to specially thank to my supervisor, Daw Nyunt Nyunt Swe, Professor and Head of Department of Applied Economics (Retired), for her valuable advice, guidance assistance and support during the preparation and writing of this thesis.

Moreover, I also like to express my thanks to my respected professors and lecturers who imparted their time and valuable knowledge during the course of my study at the Yangon University of Economics.

TABLE OF CONTENTS

	Page
ABSTRACT	i
ACKNOWLEDGEMENTS	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	v
LIST OF ABBREVIATIONS	vi
CHAPTER I INTRODUCTION	1
1.1 Rationale of the Study	1
1.2 Objectives of the study	2
1.3 Method of Study	3
1.4 Scope and Limitations of the study	3
1.5 Organizing of the study	3
CHAPTER II LITERATURE REVIEW	4
2.1 Nature of Agriculture Finance	4
2.1.1 Agricultural Credit/Loan	5
2.1.2 Loan and Types of Loan	7
2.2 Agricultural Productivity	8
2.3 Impact of Agricultural financing on Agricultural productivity	9
2.4 Review of Previous Studies	12
CHAPTER III OVERVIEW OF AGRICULTURAL SECTOR IN MYANMAR	15
3.1 Background of Agriculture in Myanmar	15
3.1.1 Policies related in Agricultural Sector	18
3.1.2 Law and by-law related in Agricultural Production	23
3.2 Agricultural Production in Myanmar	26

CHAPTER IV OVERVIEW OF AGRICULTURAL FINANCE IN MYANMAR	29
4.1 Agricultural financing in Myanmar	29
4.2 Agricultural Financing Institutions in Myanmar	30
4.2.1 MADB	30
4.2.2 Microfinance	34
4.2.3 Other Sources of Agricultural finance	35
4.3 Agricultural Loans for Mechanization and Agricultural Inputs	39
4.4 Agricultural Loans for Production	40
4.5 The relation of agricultural financing and agricultural production	43
CHAPTER V CONCLUSION	45
5.1 Findings	45
5.2 Suggestions	46
REFERENCES	48
APPENDIX	52

LIST OF TABLES

Table	Page
3.1. Policy Framework for Agriculture in Myanmar	23
3.2. Agriculture GDP and Total GDP in 1990-2017	24
3.3. Major crop production in Myanmar in 2017	28
4.1. Loan Program of MADB	31
4.2. Loan disbursement period and loan collection period	32
4.3. Loan size per Acre for Seasonal crop production loan	33
4.4. Current licensed microfinance Institutions Implementation status	34
4.5. Agricultural Machinery loan in 2011-2017	39
4.6. Agricultural Financing and Agricultural Production in 1990-2017	41
4.7. Regression correlations between agricultural loan and agricultural production	44

LISTS OF ABBREVIATION

ADB	Asia Development Bank
AML/CFT	Anti-money laundering/combating the financing of Terrorism
BRI	Bank Rakyat Indonesia
CCS	Central Cooperative Society
CSOs	Central Statistical Organization
DOC	Department of Cooperatives
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
MAB	Myanma Agriculture Bank
MADB	Myanmar Agricultural Development Bank
MEB	Myanmar Economic Bank
MFI	Micro Finance Institutions
MMK	Myanmar Kyat
MOAI	Ministry of Agriculture and Irrigation
NGOs	Non-Governmental Organizations
PPAF	Poverty Alleviation Fund
SAB	State Agricultural Bank
SAMB	State Agricultural Marketing Board
SCPL	Seasonal Crop Production loans
SLORC/SPDC	State Peace and Development Council
SOEs	State Owned Enterprises
SPSS	Statistical Package for Social Sciences
TL	Term Loans
WB	World Bank

CHAPTER 1

INTRODUCTION

1.1 Rationale of the Study

Agriculture is a vital economic sector of all world economies and one of the main contributors to the gross domestic product (GDP) of agriculture-based economies. The agricultural sector not only promotes the growth process of these economies, but also provides food to its growing population and creates jobs for a larger part of its workforce. In addition to its crucial importance and the significant contribution of agriculture to the overall GDP of agriculture-based developing countries, the productivity of the agricultural sector in the face of growing concerns about the food security of the world's population. The development of agricultural productivity requires financial services that can provide support: increased investment in agriculture and agricultural infrastructure for long-term financing. Financial institutions in developing countries provide agriculture a disproportionate share of their loan portfolio compared to the share of the agricultural sector in GDP. Agricultural finance is considered as one of the strategic resources to increase production and, therefore, raise the living standards of the rural poor farming community. Agriculture needs different forms of inputs to be productive, among which, credit is crucial. As a result, in developing countries, agricultural finance is one of the most important instruments of government to promote economic growth and reduce poverty in rural areas.

Agriculture is backbone of Myanmar's economy and plays a fundamental role in the lives of the majority of the population, 61% of whom live in rural areas. In 2017-18, agriculture accounted for 23.3% of the country's GDP, employed more than 61% of the labor force, and contributed 8.91% of the total value of exports (CSO, 2018). Agriculture continues to guide the national political agenda and has been identified as a priority development sector, in particular for increasing the production of rice, oilseeds and beans for domestic consumption and exports. Since the economy

of Myanmar is heavily depends on the agricultural sector, rural development is the fundamental concern for the country. Moreover, rice being the staple food and the main export product of the country, the efficiency of rice production is an essential factor in the country. According to Ministry of Agriculture, Livestock and irrigation, in 2016-2017, 17.6 million acres out of total 51.1 million acres were used for growing rice. Although loans and some inputs are provided to the paddy farmers, the loan available to farmers is limited and covers only a few percentages of total area.

Agricultural finance plays an important role in increasing agricultural productivity in developing countries like Myanmar. However, financing in the agricultural sector has only slowly exhausted its great potential. There is a widely recognized gap in the agricultural financial sector which has a significant impact on overall productivity. This is particularly problematic because the rural economy suffers from lack of access to adequately adapted services which can increase agricultural production. Lack of access to finance is an important barrier for farmers to improve the efficiency of their production. The absence of comprehensive financing mechanisms results in high capital and interest costs for the agricultural sector, which ultimately affects farmers' ability to generate income and the standard of living. This avoids a positive cycle in which the surplus of one-year will allow investment and will increase investment next year. This cycle will discourage farmers in the long-run and can displace many people in the agricultural sector. In addition, agricultural loans are often short term and have fixed repayment periods. This credit structure is not suitable for annual cultivation or production. Climate risks also increase investment needs to make agriculture more resilient to these risks. Therefore, there is a need to promote the financing of agriculture to stimulate investment in the agricultural sector and increase food production.

Given the need to promote investments in the agricultural sector and increase agricultural production, agricultural financing was chosen for this study as a key constraint facing for farmers in food production.

1.2 Objectives of the study

The objective of the study is to analyze the relationship between agricultural financing and agricultural production during the period of 1990-2017.

1.3 Method of Study

A descriptive method and secondary data were applied to study agricultural finance in order to increase agricultural productivity. The study analyzes macroeconomic variables such as agricultural credit and agricultural productivity from 1990 to 2017 to achieve the objective of this study. In terms of data, this study collects data through primary and secondary sources. For the primary data, written data were obtained from the Myanmar government agencies; Ministry of Agriculture and Irrigation (MOAI), Ministry of Planning and Finance, Ministry of commerce and the central statistical organization (CSOs). Secondary data were collected from other reliable resources such as World Bank (WB), Asia Development Bank, Food and Agriculture Organization (FAO) and which are also working on Myanmar's Agricultural development. The data was processed and analyzed using the Statistical Package for Social Sciences (SPSS). Descriptive statistics were used to analyze the qualitative data, while Pearson' correlation and regression were used to examine the relationship between the variables. After obtaining all the necessary information, agricultural finance from 1990 to 2017 will be compared by looking at the specific indicator and analyzing the relationship of agricultural finance to agricultural productivity in Myanmar.

1.4 Scope and Limitations of the study

This study would focus in particular on the macroeconomic financing of the agricultural sector in Myanmar over the last three decades from 1990 to 2017. This study analyzes only agricultural financing for agricultural production, and financing of livestock and aquaculture, will not be included in this study.

1.5 Organizing of the study

The content of this thesis is organized into five main chapters; Chapter 1: Introduction (Rationale of the study, problem statement, scope and organization of the study), Chapter 2 presents a Literature review, Chapter 3 presents the overview of Agricultural sector in Myanmar, Chapter 4 analyzes of agricultural financing in Myanmar and Chapter 5 summarizes the study, provides a conclusion and suggested area for agricultural Financing in Myanmar.

CHAPTER 2

LITERATURE REVIEW

2.1 Nature of Agriculture Finance

Agriculture sector is one of the main contributors to the GDP of agricultural economies in relation to other sectors of the economy and constitutes an important source of income for more than half of its total workforce (World Bank, 2008). Agricultural credit is one of the important interventions to solve rural poverty and plays an important role in agricultural development (Meyer, 2005). Credit is an important indirect contribution, among other things, to improve agricultural productivity (Sriram, 2007).

“Agricultural Finance” is the study of financing and liquidity services provides to agricultural borrowers. It is considered the study of financial intermediaries that provide loan funds to agriculture and the financial markets in which these intermediaries obtain their loanable funds. Agricultural finance is therefore the set of economic and financial interfaces between agriculture and the rest of macroeconomy, including the effects of changes in national economic policies on the economic performance of agriculture and the financial situation of farm families. Agricultural financing as a subset of rural financing. It refers to financing services of agriculture-related activities, from production to market, ranging from short, medium, and long-term loans, to leases, to crop and livestock insurance, covering the agricultural value chain-input supply, production and distribution, wholesaling, processing and marketing.

Agricultural financing defined as “an economic study of borrowing funds by farmers, the organization and operation of agricultural credit agencies and the interest of society in agricultural credit” (Murray, 1953).

Agricultural financing “as a branch of the agricultural economy, which deals with the financial resources related to each agricultural unit” (Tandon, 1971).

Credit is important and necessary for farmers because they need credit for agricultural production and for agricultural development. Agricultural financing can be treated both micro level and macro level. Macro-finance deals with different sources of raising funds for agriculture as a whole in the economy. It also refers to the loan procedures, rules, regulations, monitoring and control of the various agricultural credit institutions. Therefore, macro-finance is linked to financing of agriculture at the aggregate level.

Microfinance refers to the financial management of the different agricultural units and the study of how each farmer considers several sources of credit, the amount of credit to borrow from each source and how it is allocated to each source and how the farm allocates the same among the alternative uses. It is also concerned about the future use of funds. Therefore, microfinance deals with aspects related to the total credit needs of the agricultural sector, the conditions under which credit is available and the method of using total credit for agricultural development. Microfinance refers to the financial management of individual agricultural enterprises.

2.1.1 Agriculture credit/Loan

In agriculture, all farmer groups need credit; small and marginal farmers, which are the majority of farming population, need it most. Agricultural growth has a multi-faceted dimension which involves a change in structure of production, allocation of resources, changes in process of production, changes in cropping pattern, which is not possible without affordable and sufficient credit.

They generally have insufficient access to productive assets and very insignificant access to the formal source of credit. Access to microcredit for small and marginal farmers can help them avoid falling into the poverty ladder. Microcredit providers have generally not failed to meet the credit needs of small and marginal farmers due to their financing priority for the poor and some superficial problems such as investment risks in agriculture; seasonality of agricultural production; poor return on agricultural loan repayments; and the technical nature of the agricultural production system.

“Agricultural credit” is the money granted to farmers to boost the productivity of the scarce agricultural resources. Agricultural credit can be classified according to the purpose, term (repayment period), and security, the generation of surplus funds, the creditor and the number of activities for which credit is provided.

- I. Based on the purpose for which loan is granted, agricultural credit is categorized into:
 - a. Development credit or investment credit to provide for acquiring durable assets or for improving the existing assets. Under this, credit is extended for:
 1. Purchase of land and land reclamation
 2. Purchase of farm machineries and implements
 3. Development of irrigation facilities
 4. Construction of farm structures
 5. Development of plantation and orchards
 - b. Production credit is providing for crop production
 - c. Marketing credit is providing to carry out the marketing functions and to get higher prices for the produce
 - d. Consumption credit is the credit required by the farmer to meet his family expenses
- II. Repayment period is based on the period for which the borrower requires credit, it is divided into:
 1. Short-term credit, which is provided to farmers for periods ranging from 6 to 18 months and is primarily meant to meet cultivation expenses; purchase of seed, fertilizer, pesticides and payment of wages to laborers. It serves as the working capital to operate the farm efficiently and is expected to be repaid at the time of harvesting/ marketing of crops. It should be repaid in one installment.
 2. Medium-term credit is for the purchase of pump-sets, farm machineries and implements, bullocks, diary animals and to carry out minor improvement in the farm. It can be repaid within 2 to 5 years either in half yearly or annual installments.
 3. Long-term credit is advanced for periods more than 5 years and extends even unto twenty-five years against mortgage of immovable property for undertaking development work; purchase of tractor, and making permanent improvement in the farm. It has to be repaid in half-yearly or annual installments.
- III. Security credit is provided to farmers based on the security offered by them.
 - a. Farm Mortgage credit is secured against mortgage of land.

- b. Collateral credit is provided against the security of livestock, crop or warehouse receipt.
- c. Personal credit is provide based on the character and repaying capacity of the person and not on any tangible assets. In general, Long term credit is usually advanced against security of land while medium-term and short-term loans are sanctioned against personal and collateral security.

2.1.2 Loan and Types of Loan

There are two different types of credit, formal and informal, are accessed by small farmers.

1. Formal Financial institutions

Formal financial institutions are organizations owned, controlled, authorized and registered or regulated by the government. These include the commercial banks, state-owned banks, agricultural development banks and rural banks. According to the study by Chowdhury and Garcia (1993), the number of loans granted from the formal financial institutions in the developing countries obtained by rural borrowers is low. The reasons for this low gain include the long and complicated loan procedures that often outweigh the poor and uneducated farmer-borrowers. In addition, obtaining loans from formal institutions overloaded the rural borrowers in terms of slow release of the funds and higher transaction costs, which led them to borrow from informal sources (Chowdhury, 1993).

2. Informal Financial Institutions

Informal financial institutions operate without physical collateral, involve small loans and short-term transactions, and are characterized by the adaptability and flexibility of operations in a certain area (Adam, 1992). The informal sector has emerged in rural areas due to the failure of many formal credit programmes. Informal credit is attractive in the rural areas because these sources are the only way to provide financial services to the rural households located in remote areas, and their loan collection records are better than for many formal institutions (Kashuliza, 1993). Other reasons for accessing informal finance also include easy accessibility, the fact that they are collateral-free, higher loans amounts can be extended and the uncertainty

of formal credit institutions to grant loans to small farmers because of the risk of default (Corales, 1983).

Furthermore, a study by the Asia Development Bank (ADB) in 1989 showed that rural informal credit in Asia remains an important role, as it represents approximately two-fifths of total rural credit in Bangladesh, India and Thailand and more than two-thirds in the Philippines (ADB, 1989).

2.2 Agricultural Productivity

The concept of productivity is a relative term and is sometimes considered as an overall efficiency and effectiveness of the productive units or as a ratio of output to the corresponding inputs used. The common characteristics of productivity is the ability to produce more economically and efficiently (Mohammad, 1992). "Agricultural productivity" is measured as the relationship between agricultural production and agricultural inputs. The term productivity has been used in different meanings and has stimulated many conflicting interpretations. Sometimes the overall efficiency with which a production system operates is considered, while others are defined as a relationship between production and resources spent separately or collectively. This term has also been used incorrectly and interchangeably with production. In reality, production refers to the volume of production, while productivity implies production in relation to resources spent. Production can be increased using more resources without increasing productivity. Agricultural productivity is one of the key determinants of high and sustained agricultural growth, and makes it a key determinant of its longer-term growth. It remains a vital economic engine for developed and developing countries and would play an essential role in poverty eradicating, especially in poor countries. Therefore, agricultural productivity can be defined as a measure of efficiency with which an agricultural production system employs land, labor, capital and other resources.

Agricultural productivity can be defined as the "relationship between the index of local agricultural production and the index of total input used in agricultural production" (Shafi, 1984). He has mentioned that the labor productivity is measured by the total agricultural output per unit of labor. It relates to the single most important factor of production, is naturally appealing and relatively easy to measure.

(Dewett, 1966) defined "agricultural efficiency as the productivity that expresses the variable relationship between agricultural products and one of the main

inputs, such as land, labor or capital, while other complementary factors remain the same". (Singh, 2000) suggested that the "yield per unit" should be considered to indicate agricultural productivity. In a theoretical analysis, the comparative advantage argument to rebut the claim that agricultural productivity is an engine of economic growth (Matsuyama, 1992). Agricultural production can grow in two main ways: an increase in use of resources of land, labor, capital and intermediate inputs or through advances in production techniques through which greater output is achieved through a constant or decreasing resource base. The latter, also referred to as productivity, occurs without a corresponding change in production, resulting in an increase in the ratio of total outputs to inputs (Hayami, 1985). Agricultural productivity here refers to the yields of arable land or cultivable land unit. Therefore, in this study, agricultural productivity could be defined as the relationship between production and inputs as agricultural loans.

2.3 Impact of Agricultural financing on Agricultural productivity

Credit plays an important role in increasing agricultural productivity. With limited access to credit, the budget balance can become a constraint on agricultural production. This condition becomes a leader and the quantities and combinations of inputs used by a farmer may differ from the optimal level and may limit the optimal production or consumption options. Economic theory suggests that farmers with limited capital tend to use lower input levels and combinations of inputs than those whose productive activities are not limited by capital constraints. Agricultural productivity and economic growth prevent limited access to credit (Odoemenem, 2010). Agriculture loan plays a central role in improving agricultural productivity. An adequate supply of agricultural loans to farmers secures the necessary machinery, farm operation, and supplies (Saboor, 2009).

Farmers' access to credit is crucial, as it can facilitate the level of input use closer to their potential when capital is not a constraint, resulting in higher levels of production per farm and productivity. This implies that the marginal contribution of credit brings input levels to optimum levels, thereby increasing production and productivity.

(Jackline. W, 2013) analyzed the relationship between the agricultural credit financing and the financial performance of farmers. He found that the availability of

loans and the amount of loans received greatly affected the financial performance of the farmers. The study also found that the loan repayment period and the interest rate applied had an impact on the farm's financial results. The timely availability of loan allows farmers to buy the necessary supplies and machinery to carry out agricultural operations. (Obilor, 2013) applied a regression analysis and found that credit allocation to agriculture had a significant positive result in productivity.

The impact of agricultural credit on agricultural production, efficiency and productivity can be observed through multiple channels. First, formal credit can be used to buy inputs during the cultivation season, which allows the farmer to maximize crop yield. This chain represents a direct and seasonal impact on production. Secondly, formal credit can be used to invest in irrigation facilities, machinery and draft animals that represent the use of credit to support agricultural production, which generally affects late production. The third is that formal credit is often used to replace informal credit with high interest charges.

According to (Gylfason, 2001), sustained economic growth requires high quality savings and investments. Agricultural productivity and economic growth prevent limited access to credit line. Agricultural credit has been identified as an important factor for the development of agriculture, not only in transition and developing countries, but also in developed economies. Credit markets in developing countries tend to focus on the impact of credit on productivity, investments in agriculture and rural development in other areas (Carter, 2003).

Access to financing is essential for the growth of the agricultural sector. The transition from subsistence production to commercial agricultural production requires funds. In most developing countries, agricultural financing is considered an important factor in increasing agricultural production and rural development, as it improves productivity and promotes living standards by breaking the vicious cycle of poverty of small-scale farmers (Adebayo OO, 2008).

Ekborn (1998) employed Cobb-Douglas production function with agricultural productivity as the dependent variable. The independent variables used were labor input, materials, physical resource endowment, human capital and physical capital investment. The results from ordinary least square regression indicated that soil conservation quality, the cost of agricultural inputs and labor availability were positively correlated to agricultural productivity and statistically significant. Farm size and distance from key resources and major infrastructures such as water and roads

were negatively correlated to agricultural productivity and were statistically significant. Soil capital investments, capital assets, access to credit, off-farm nonagricultural income also contributed positively to productivity (Ekborn, 1998)

Tiffin and Irz (2006) in their study “Is agriculture the engine of growth” focuses on the causal link between agricultural value added per worker and GDP per capita, where they conclude that agricultural value added is a causal variable in developing countries. Their study confirms that agriculture is the engine of growth in developing countries, and also verifies that the growth of agricultural productivity is necessary for the economy to move, as it releases a surplus of food, labor, raw materials, capital and foreign exchange, while simultaneously generating demand for industrial goods and services (Tiffifn, 2006).

Irz, Lin, Thirtle and Wiggins (2001) in their study “Agricultural Productivity Growth and Poverty Alleviation” highlighted the role of agricultural growth in poverty reduction. In the midst of agricultural growth, they advocate for job creation, linkages between agriculture and the rest of rural economy, and a decline in real cost of food for whole economy. The study clearly shows the consequences of agricultural growth in terms of higher incomes for farmers, increased employment and higher the rate of agricultural wages, improved investment and social well-being as well as increased tax revenues. As a result, the national economy is better-off in terms of reducing food prices, increasing real wages, increasing savings, improving foreign exchange to import capital goods and essential inputs for agriculture sector. Furthermore, while the agricultural sector is the engine of the economy in developing countries, other types of industries are also in better shape and perform well in the agriculture sector. A yield increase of one-third in agriculture sector could reduce the number of people living in poverty by at least a quarter or more (Irz, 2001).

Despite the above arguments, finance remains the key to investment in the regions and therefore growth. Agricultural credit and rural finance play an important role in the recovery and growth of countries in transition. A positive impact of agricultural loans on agriculture has a positive effect on the exports, that is, it increases exports and, therefore, reduces imports of agricultural products. A positive impact of the agricultural loans on agriculture has a positive effect on exports, that is, it increases export and consequently, reduces imports of agricultural products. This is a positive effect on the economy of the country compared to the economies of other countries. An increase in agricultural loans can cause such an effect. This increase in

credit is accompanied by good credit management, so they are effectively offered, used and reimbursed. Agriculture is the backbone of the economies of most developing countries and, therefore, has a great influence on micro and macroeconomic variables. An effect on agricultural factors also affects the economy, positively or negatively.

In addition, agricultural development is expected to have a significant impact on poverty reduction. The study by the World Bank reveals that GDP growth of agriculture is at least twice as effective in reducing poverty than GDP growth of outside agriculture (World Bank, 2008).

2.4 Review on Previous Studies

Agricultural development is a key sector that will remain essential for the economic development. Johnston and Mellor (1961) account explicitly for agriculture as an active sector in the economy. In addition to labor and food supply, agriculture plays an active role in economic growth through important production and consumption linkages. In demand side, Agriculture can provide raw materials to non-agricultural production. On the consumption side, a higher productivity in agriculture can increase the income of the rural population, thereby creating demand for domestically produced industrial output. Such linkage effects can increase employment opportunities in the rural non-farm sector, thereby indirectly generating rural income (Johnston, 1961).

Matsuyama (1992) suggests that the relation between agricultural growth and overall economic growth depends on the openness of a country to international trade. Whereas agricultural growth goes hand in hand with economic growth in small, closed economies-where gains in agricultural productivity will lead to the linkage effect described above-the relation might be reversed in the case of an open economy (Matsuyama K. , 1992).

Access to credit for individuals and businesses, including countries, was positively associated with asset growth, investment and overall economic growth (King. R.G. and Levine, 1993).

The exclusion of the masses of basic services from a financial system leads to a significant loss of a gross domestic product (GDP) of a country (Chattopadhyay, 2011). Identifying the relationship between economic growth and agricultural finance

remains important for policy objectives that may include different types of support for agricultural loan initiatives.

Financial institutions are reluctant to accept the prevalent risks in the agricultural sector, such as droughts, floods, pests and diseases, or the transaction costs of covering large geographical distances. Therefore, although governments are currently trying to attract investments in agriculture, the lack of understanding of the financial risks and opportunities in agriculture deprives the sector of much-needed funds to boost production, processing and marketing.

The financing of agriculture is one of the most important factors for the development of rural areas in developing countries. The payment of bank credit is a means of financing. Some policymakers believe that providing low-interest loans to farmers can help them offset some of the results of development politics that threaten their well-being. Recent theoretical and empirical studies in economic have established that credit markets in developing countries operate inefficiently due to a series of market imperfections.

However, in developing countries, where agriculture is a source of livelihood for 86 percent of rural population, financing for investments in agriculture is scarce, even for large investors. In addition, the financial supports provided by the government to finance agriculture in developing countries is very low compared to the total requirements.

Microfinance has been considered a noble substitute for bridging the financial gap in agricultural sector left by the governments (Morduch, 2002). Therefore, Governments have tried to improve the working conditions of microfinance, including the establishment of good infrastructures in rural areas, to encourage investment and enable microfinance to operate freely. This results in an increase in the number of microfinance branches and the availability of loans, especially in villages. But no effort has been made to manage risk or better avoid it. Farmers in developing countries do not have access to both modern instruments of risk management such as, agricultural insurance, futures contracts, or guarantee funds and ex-post emergency government assistance (Wenner, 2010).

The 2008 World Development Report indicates that in agriculture-based economies, agriculture may be the main driver of growth, while in developing countries, agriculture is already less important as a source growth, an economic activity but remain important instrument to reduce rural poverty. On the contrary, in

urban countries, agriculture plays the same role as other marketable sectors and subsectors with a comparative advantage that can help to generate economic growth (World Bank, 2008).

In Sudan, agricultural financing is considered one of the main factors affecting food crop production. There are many obstacles regarded the provision of short and long-term agricultural credit, mainly the small percentage for agricultural sectors injected by the agricultural finance institutions, and continues to show steadily but slowly progress, since there is large variation between the different branches in terms of performance and efficiency. These policies, reflected by a large number of farmers, particularly in the irrigated and mechanized rain-fed sectors, continue to complain about the agricultural financing mechanism.

The experiences of the agricultural value chain financing model in Myanmar shows that financing is an important issue for the development of agricultural value chains. The private sector providers sell the inputs to farmers on credit, but this supplier credit rarely self-sufficient because the companies themselves lack sufficient funding. They need financing which is difficult to obtain. In order to recover sales revenue quickly, they prefer cash sales rather than selling inputs to farmers with deferred payment. Consequently, in Myanmar, the agricultural input retailers offer deferred payment sales at a high interest cost, which results in an inflated price for farmers. Farmers at least benefit from having access to sales on credit, but it is expensive. Given that financing is a hindrance for both farmers and their agricultural input suppliers, more financing is required in the value chain, but currently the very limited capacity of the banks in rural areas and the fragmented nature of the value chains make this financing unavailable (Myint, 2007)

Therefore, it remains to be seen whether the increase in microfinance branches and the availability of loans are sufficient factors for microfinance to play a role in reducing the agricultural financial gap, despite of risks associated with agricultural financing. Still the majority of farmers lack the timely access to institutional credit in adequate amounts needed in the production process.

CHAPTER 3

OVERVIEW OF AGRICULTURAL SECTOR IN MYANMAR

3.1 Background of Agriculture in Myanmar

Agriculture is the backbone of the Myanmar economy. In 2017-18, agriculture accounted for 23.3% of the country's GDP, employed more than 61% of the labor force, and contributed 8.91% of the total value of exports (CSO, 2018). And the progressive achievement in agriculture sector such as production, services and trade, are being shared to national development. The importance of agriculture in Myanmar is highlighted by the stated objectives of making agriculture as the base of the country's economy and the engine for the overall development of other sectors. The three main objectives of the agriculture sector set up by the Myanmar government are: (i) to achieve surplus in paddy production; (ii) to achieve self-sufficiency in edible oil; and (iii) to step up the production and export of pulses and industrial crops. At the same time, within the context of market-oriented economic system, freedom in agricultural production and participation of private sector has become the main policies of agricultural sector. Government has defined the four economic policies of which one of the major economic objectives is "building the modern industrialized nation through the agricultural developments, and all-round development of other sectors of the economy." But Myanmar's great natural potential for agricultural growth is hampered by a legacy of misguided policies and state-controlled markets that are partly responsible for the low productivity. Over past decade, some major policy reforms and measures covering the sector have been put in place. These included the eradication of the rice production quota for farmers, liberalization of domestic and international marketing of rice in 2003 and of the majority of industrial crops in 2004, the adoption of a series of regulatory laws (a plant pest quarantine law in 1990, a fertilizer law in 2000, a pesticide law in 1993, seed law in 2012, farm land law in 2012, vacant, fallow and virgin land law in 2012, plant variety protection law in 2016). Since then, the government has changed economic environments by developing new plans and establishing new policies for economic development.

The objectives for economic development laid down by the government are;

1. Development of agriculture as the base and all-around development of other sectors of the economy as well,
2. Proper evolution of the market-oriented economic system,
3. Development of the economy inviting participation in terms of technical know-how and investments from sources inside the country and abroad, and
4. The initiative to shape the national economy must be kept in the hands of the state and the national people.

Then, the government also managed the economy by annual plans with following objectives.

- a) To achieve economic recovery with stability in the short-term period,
- b) To lay down firm foundation for sustainable growth in the long-term period.

Priority was given to the development of primary sectors such as agriculture, livestock and fishery sector, while strengthening of other socio-economic sectors was also emphasized. Actually, among 13 sectors in Myanmar, agricultural sector has been a dominant sector and the backbone of economic development in Myanmar, and it still plays a vital role in GDP and is closely linked to other sectors until the present days. Therefore, the government has also concentrated on the important of reforms undertaken in agricultural sector include:

- 1) Allowing farmers to cultivate crops of their choice and to process, transport and trade freely.
- 2) Allowing the state, cooperatives and private enterprises to reclaim and utilize fallow and cultivable wasteland up to 50,000 acres for the enhancement of agriculture production.
- 3) Diversifying exports through introduction of new products and emphasizing on semi-processed and processed goods.
- 4) Allowing foreign direct investment, and
- 5) Abolishing price controls and reducing subsidies.

With the aim to accelerate development of economic and social condition of the country, a short-term plan from 1992-1993 to 1995-1996 has been formulated and implemented. The main objective of the short-term plan is to step up production and export for the complete economic recovery and to speed up the development of the economy.

The major policy objective for agriculture sector in its short-term four-year plan (1992/93-1995/96) are:

1. To achieve surplus in paddy production for export,
2. To achieve self-sufficiency in edible oil for saving of foreign exchange through import substitution and
3. To increased production and export of industrial crops, pulses and other crops for foreign earnings.

In order to fully implement the policy objectives, more explicit strategies have been formulated with the strong government's support since the beginning of the first four-year plan. The reform strategies of agriculture sector can be also summarized as follows;

1. Development of new agricultural land
2. Increased provision of irrigation works
3. Expansion of small-scale agricultural mechanization
4. Transfer and application of new technology, and
5. Increased supply of agricultural inputs quality seeds

The remarkable policy change with direct impact on agriculture sector are; Liberalizing farmers in production and marketing, and allowing domestic trade as well as export of agricultural products to the private sector with exception of rice export. The government conducted not only policies and strategies but also structural change of agriculture sector, consistent with new economic system. MOAI was reorganized three main objectives; to achieve surplus in production, to achieve self-sufficiency in edible oil and to step up the production of exportable pulses and industrial crops. (NAING, 2002)

3.1.1 Policies related on Agriculture sector

After independence, the first national government developed a plan known as the country's economic reconstruction in 1947. The main objective of the plan was to further diversify agricultural production into cash crops such as sugarcane, jute, tobacco and cotton, both for domestic consumption and for exports. Rice has remained the dominant crop.

One of the first actions of the new government was the Land Nationalization program. The objective was for the state to take over all agricultural land, in particular the large areas acquired by foreigners, especially the moneylenders, during the colonial period and redistribute it equitably to those who were actually cultivated the land. Another important change has been made to agricultural marketing policies. Apparently, in order to stabilize domestic prices in the face of sharp fluctuations in international prices, the government introduced an official paddy and rice purchasing system. This was done by the State Agricultural Marketing Board (SAMB) in order to replace foreigners who had dominated the paddy market as intermediaries. The price of public markets remained constant for a long time until 1961.

In the early years of the policy, the domestic price was fixed at level so low below the international price received for rice exports that the government made large profits which it used to finance development in other sectors. The same approach has also been applied to other products such as sugarcane and cotton. The policy was implemented by state marketing boards which have obtained a monopoly in the export trade in rice and timber. The only characteristic that redeems this pressure is that the state procurement system always operated in an open market framework and always allowed farmers to make their own decisions about what to produce, how to produce and who to sell, in somewhat limited situation.

An isolated inward-looking self-sufficiency policy in the form of "Burmese way to socialism" was declared official policy and directive for future development of the nation in 1962, giving priority to industrialization. The objectives of the concept were autonomy, nationalization and strict neutrality in line with "socialism". All foreign trade, domestic wholesale and even retailers have been nationalized. When nationalization was not required, producers are planned crops that grow in the area designated by government, but they must also sell them to the state at the price set by government that was below market rates. Rapid nationalization and the abandonment of the role of agriculture have caused a stagnation in the economy as a whole,

including the agricultural sector. To overcome the stagnant economy, the government was forced to reform some of its economic policies, practices, and institutional structure with a focus on improving the agricultural sector.

The government made important changes in land policy in 1963, giving priority to the poorest, without worrying too much about whether they had the skills or resources to cultivate. In accordance with the Tenancy Law of 1963, the right of tenancy was granted only to the Agrarian Committees set up in all rural areas. These Agrarian Committees, in turn, allocated the land to individual farmers, the poorest given the first priority, without much regard to whether they had the requisite skills or resource, such as seed, drought cattle or farm implements, to undertake cultivation. This approach has had serious negative effects on the land productivity.

The government has also passed a Farmers' Rights Protection Law, according to which no one can confiscate or seize any of the farmers' means of production in payment of debts. Obviously, the factors of production by which farmers earn their living must be protected from confiscation. However, the best solution in this case is to provide farmers with access to the organized credit market where they can get loans at reasonable terms and will not fall into a debt trap. There has been a double pressure on agriculture, as the state and cooperative sectors have also determined compulsory delivery quotas, and fixed prices for all major crops. This compulsory delivery system was also biased against the large farmers, as the quota ratio being gradually increased according to the size of farm, which greatly disincentive enterprising farmers from increasing their production. The farm household did not have the freedom to choose the crops to cultivate and had to follow a cropping pattern that was not always compatible with the capability of the land. (Khin Maung Kyi, 2000)

Myanmar' economic policy during the socialist period (1962-1988), particularly until the early 1970s, was essentially a policy of agricultural exploitation, with strong emphasis on rice production. In the mid-1970s, efforts to boost agricultural production by increasing productivity through a "green revolution" using high yield variety (HYV) seed and fertilizer began to bear fruit. As a result, the performance of the economy has improved for some time, but could not be sustained, as there was no real change in the basic political position of promoting state-led industrial development that of agriculture or the way the economy was managed or poor managed. As a result, the unfortunate failure of state-led import-substituting industrialization continued to drag the whole economy down with its insatiable need

for foreign exchange to import raw materials and spare parts, while too much intervention in the agriculture sector has delayed agricultural growth, and prevented exports from increasing significantly.

In 1971, the government implemented the “Twenty-Year Plan”, which included the four terms of the four-year plan. Agriculture was negatively affected by 1982-1987 policy framework in which the centralized economic planning system determined the types and areas of crops to be cultivated and the inputs to be used by individual farmers, the public sector agencies that purchase crops at fixed and low prices. Farmers responded quickly to the relaxation of controls in 1987-1988, which resulted in the expansion and diversification of crops. In 1988, the economic policies drastic change the movement from inward-looking, nationalized policy to outward-looking, market-oriented. Many of the economic reform measures introduced immediately during the first half of the 1990s.

The state law and order Restoration council (SLORC) developed the short-term plan (1992/93-1995/96), in which the first and second year were designed as “Economic years”, and the third year as “All round development Year”. In the name of economic liberalization, the current agricultural sector is considered as one of the three main sectors of economic growth. The Government recognizes the importance of agriculture for Myanmar’s economic development, which is reflected in a number of its reform initiatives in the past decade. In 2011, when new government came to power, Myanmar embarked on a major reform policy that included anti-corruption, currency exchange rate, foreign investment laws and taxation. Myanmar Government announced primary policy on agricultural development by defining the agricultural sector as the main engine of national economy, and announcing prioritization of the development of agricultural sector, livestock and fishery sector, food security in the face of climate change and improved of farm income as well as poverty alleviation. Based on this policy, the Ministry of National Planning and Economic Development established the Central Committee of Rural Development and Poverty Alleviation. Accordingly, Ministry of Agricultural and Irrigation (MOAI) defined short-term development strategy (5 years) in 2012 and designated it as the fifth five-years plan for the agriculture sector from 2011/12 to 2015/16 aimed to strengthening agricultural financing as one of five prioritized targets.

Policies related to agriculture sector of Myanmar are as follows:

- Land Use and Management policy
- Agricultural production policy
- Agricultural financing policy
- Agricultural mechanization and input policy

i. Land Use and Management Policy

Land policies in Myanmar have historically been characterized by the following characteristics; in British Colony, Land is owned by the state, but has granted land ownership rights and benefits such as the free choice of crops to cultivate, the right to sell and mortgage the land, and the right of the landholder's family to inherit the rights over the land. Since 1953, when the Land Nationalization Act removed private land ownership rights, each successive government regime has maintained a policy on state ownership of land while granting farmers the right to cultivate. In the Parliamentary era (1948-1962) the land management approach focused on "equity" (land use rights) rather than "productivity": while socialist regime (1963-1988) focused on strengthening "government control over farmers" and created cropping plans for farmers and enacted purchase quotas.

Under the market economy approach of the SLORC/SPDC government (1989-2010), there was some liberalization in trade and marketing and new provisions allowing land use for large-scale agricultural enterprises resulted in land disputes with customary users. The current government recognized the importance of land rights to make "equitable and sustainable use of land" and made legislative changes regarding access to land for agricultural purposes, namely the farmland law (2012) and the vacant, Fallow and Virgin land management law (2012). Moreover, laws such as the foreign investment law (2012) and the special economic zone law (2014) stipulate provisions for the use of land by private investors.

ii. Agricultural Production Policy

Agricultural production policy in Myanmar, particularly since 1964, has focused on maximizing production rather than the farmers' income. Since 1988, the emphasis on production has intensified, as domestic self-sufficiency and food security became the main concern of the decision makers. The 'Paddy after paddy' or introduction of the 'summer paddy' in addition to the existing 'monsoon paddy'

reinforced the dynamics of maximizing production. Production was controlled by various regulations that governing such areas as the supply of inputs and provision of loans, choice of crops to grow, and assigning of priorities to the crops. The conflict of interest between the policy objective of the government (to maximizing production) and the objective of individual farmers (maximizing income) remained an obstacle to achieving the objectives of the government's agricultural policy (Soe, 2004).

iii. Agricultural financing policy

Myanmar Agricultural and Rural Development Bank (MADB) has been carrying out the scheme called Rural Saving Promotion Program since October 1993. This aims at increasing the agricultural production through effective use of the farmer's capital which lent at low interest rates to farmers who have made deposits at bank. These loans are mainly used for purchasing fertilizer (OECD, 1997). To help support for the establishment of people-centered financial institutions, such as revolving funds, microfinance, block grant to improve the livelihood and incomes of rural population, the microfinance law was passed in 2011 to target the poor, especially landless farmers who cannot benefit from MADB support.

iv. Agricultural Mechanization and Input Policy

In MOAI's second short-term five-year plan on agricultural policies and strategic plan endorsed in 2016, it was clearly stated that it was helping to support the increasing use of well-adapted and quality agricultural machinery and equipment to transform into modern agricultural mechanization system. Seed law and fertilizer law was formulated, enacted and enforced laws, procedures, directives to ensure the safe and systemic use of fertilizers, pesticides, herbicides, and other agriculture inputs. Although the government subsidy did not provide support to farmers, the government supported farmers by selling agricultural inputs include pesticides, fertilizers, seeds and fuels at prices below market prices until 2005-2006, but is largely eliminated at present. In case of irrigated areas by pumps, the subsidy for diesel oil distribution was implemented in particular for the summer paddy until 2010, but was abolished since 2011.

3.1.2 Law and by-law related on Agriculture Production

(a) Seed Law

The seed law was enacted on 2011 and came into force after two years, 2013, in order to implement the seed industry as economically and systematically. The preparation is going to establish the regulation of seed law.

(b) Fertilizer Law

The fertilizer law is promulgated to systematically maintain the fertilizer industry and to utilize qualified fertilizers by the farmers. On the basis of this law, the following works are carried out; (a) recommend the quality of chemical fertilizers produced in domestic markets, (b) announce the quality of chemical fertilizers distributed by the field inspection, and (c) systematically monitor chemical fertilizers produced and distributed.

Table 3.1 Policy Framework of agriculture in Myanmar

1987	<ul style="list-style-type: none">• Participation of private and cooperative sectors in foreign trade• Relaxation of government monopoly on the domestic marketing of paddy and some important crops
1988	<ul style="list-style-type: none">• Removal of restrictions on private sector participation in domestic and foreign trade• Introduction of liberal foreign investment law• Restitution of small-and medium size establishments
1989	<ul style="list-style-type: none">• Decontrol of prices• Official revocation of 1965 law of establishment of socialist economic system• Regularization of border trade• Introduction of Seed law allowing private sector participation in economic activities• Relaxation of restrictions on private investment
1990	<ul style="list-style-type: none">• Introduction of Myanmar Agricultural and Rural development law
1997	<ul style="list-style-type: none">• Procurement of paddy through a tender bid system but did not materialized and the requirement of to sell paddy to state remain as usual

1998	<ul style="list-style-type: none"> • Leasing of fallow and virgin land for cultivation or livestock breeding by private farmers including foreign investors
2000	<ul style="list-style-type: none"> • Reform fertilizer law
2003	<ul style="list-style-type: none"> • Liberalization of domestic and international marketing of rice
2004	<ul style="list-style-type: none"> • Liberalization of marketing on most of industrial crops
2012	<ul style="list-style-type: none"> • Reform seed law • Reform farm land law and vacant, fallow and virgin land law • Designed fifth 5-years short-term development strategy
2016	<ul style="list-style-type: none"> • Introduce Myanmar agricultural development strategy • Announced Myanmar Economic policy

Source: FAO (2005), Okamoto (2008), Wong and Wai (2013)

In 2011, Myanmar Government announced the primary agricultural development policy by defining the agricultural sector as the main engine of national economy, and announcing prioritization of the development of agricultural sector, livestock and fishery sector, food security in the face of climate change and improved of farm income as well as poverty reduction. Accordingly, Ministry of Agricultural and Irrigation (MOAI) defined short-term development strategy (5 years) in 2012 and designated it as the fifth five-years plan for agriculture sector from 2011/12 to 2015/16, to strengthening agricultural financing is one of five prioritized targets.

Table 3.2: Agriculture GDP and Total GDP (1990-2017)

Year	Agriculture GDP	Total GDP	Agriculture growth rate (%)	GDP growth rate (%)
1990	19470.6	50259.5	2.0	2.8
1991	18708.3	49933.3	-3.9	-0.6
1992	21028.6	54756.6	12.4	9.7
1993	22008.7	58063.9	4.7	6.0
1994	23483.3	62406.1	5.9	7.5
1995	24764.7	66741.6	4.8	6.9
1996	25697.6	71042.4	5	6.4

1997	26480.4	75123.1	3.7	5.7
1998	27417.3	79460.2	4.5	5.8
1999	30297.3	88157	11.5	10.9
2000	33658.9	100274.8	12.4	13.7
2001	1346030.3	2842314.4	8.1	11.3
2002	1409041.3	3184117.3	6	12
2003	1539696.6	3624926.4	11.7	13.8
2004	1697099.7	4116635.4	11	13.6
2005	1878319	4675219.6	12.1	13.6
2006	5151261.6	13893395.3	9.7	13.1
2007	5535774.1	15559412.8	7.9	12
2008	5799789	17155078.1	5.9	10.3
2009	6043622	18964940.4	5.6	10.6
2010	11108404.4	39776764.9	4.7	9.6
2011	10750196.9	42000875.7	-0.7	5.6
2012	10724796.7	45080661.5	1.7	7.3
2013	10959270.5	48879158.5	3.6	8.4
2014	11113012.3	52785050.8	2.8	8
2015	11357413.2	56476225.1	3.4	7
2016	11261660.5	59787128.5	-0.5	5.9
2017	1346030.3	2842314.4	8.1	11.3

Source: central Statistical organization

In 2012, newly enacted agrarian act has allowed granting fund by holding collateral on farmer's farmland as measures to expand fund supply to agricultural sector. As a result, agricultural growth rate increased 1.7% and 7.3% in GDP growth rate as shown by table 3.2.

Furthermore, in the broad framework for Economic and Social Reforms (FESR), political priorities for 2012-2015 include increasing agricultural productivity by increasing government loans. Moreover, the Government of Myanmar has recognized the need to improve the efficiency of Myanmar Agricultural and Development Banks (MADB), which is the main provider of agricultural financing.

3.2 Agricultural Production in Myanmar

Agriculture in Myanmar, dominated by paddy production, generates a direct or indirect economic livelihood for more than 75% of the population. Rice is the main staple food of Myanmar, therefore, rice crop occupied 17695 acres, which covers 34.1% of total cultivated area. Rice is the country's primary agricultural product, which accounts for nearly 43 percent of total value of agricultural production. Myanmar has a long tradition of rice production. In the years immediately before World War II, it was the largest rice-producing country in the world and remains one of the ten largest rice-producing countries in terms of total yield (IRRI, 2002).

Myanmar is a relatively large country with a considerable land border and relatively abundant water resources. The country has several different agroecological zones that allow the production of a wide range of crops. Ministry of Agriculture, livestock and Irrigation stated that more than 31% of 161,294,548 acres of land were arable in 2017-2018. About 17.82% of agriculture area was net area sown. For decades, the agricultural productivity has faced numerous government controls and insufficient investment in the sector. Paddy production dominates Myanmar's agricultural economy: paddy production accounts for approximately half of all cultivated area. Pulses and oilseeds represent an additional 20% each, while horticulture crops, root crops and other cereals represent the rest. Farmers generally grow staple crops such as paddy, pulses and oilseeds on relatively large areas, 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.

Myanmar has the potential to grow food not only to feed itself but also be one of the leading food producers in the region. The government has recognized the importance of the agricultural sector for economic development by launching a comprehensive reform program. The economic reforms from 1988 removed many of the previous restrictions imposed on farmers. While the state retained ownership of the land and monopoly on rice exports, farmers, in theory were free to choose what to grow. In practice, the government still effectively controlled the cropping pattern for main crops, namely rice, cotton, and sugarcane. Paddy was the crop subject to most controls as a designated national crop, with economic, political, and social importance. However, while a compulsory quota accounting for 10% to 12% of total production was imposed on paddy farmers, the farmers were allowed to sell any remaining balance or surplus to the free market. Even these partial reforms had a

notable impact on production and rice yield and production increased during the 1990-2002 period. Much of the production increase came from the large increase in area of summer paddy from 1992-1993. There was a further liberalization of rice policies in 2003. The compulsory quota for paddy was ended, although the government still controlled the cropping pattern for key crops.

The liberalization of policies from 1988 had an even greater impact on non-paddy crops, particularly pulses and oilseeds. The sown area of exported pulses (black gram, green gram, and pigeon pea) grew rapidly by about 10% per annum over 1990-2000, while production increased nearly fourfold during the same period. The area and yield of pulses has continued to grow steadily since then, helped also by price incentives for farmers. Despite their growth, yields have remained low at less than 1 t/ha as these crops are grown mostly under rain-fed conditions with generally poor seedling establishment and limited application of fertilizers and pesticides. Pulses and beans have become important to the rural economy of Myanmar, not only for their income-earning potential, but also because of their dietary contribution. The three pulse crops, green gram, black gram, and pigeon pea, also accounted for over 80% of total export value for crops.

Edible oil is the second most important food item in the traditional diet of Myanmar, and palm oil is still imported to meet domestic demand. Oilseed crops were planted largely in the dry zone of central Myanmar. Sesame accounts for roughly 46% of the area sown to oil crops, with a further 25% taken by groundnut and 16% by sunflower.

Among industrial crops, cotton, rubber, and sugarcane are the most significant with important links to agricultural-based industries. While the sown area of rubber has expanded significantly since the mid-1990s, the cotton and sugarcane have remained largely stable, at least since 2000-2001. Only yields of cotton have increased noticeably since 2000-2001.

Maize production has grown far more rapidly than rice, on the heels of rapidly growing demand for poultry feed and emerging regional export markets. Pulse production has grown more rapidly than any other agricultural commodity group since liberalization in 1988, at a compound annual rate of 9% per year. Horticulture and poultry output have grown at 6% to 7% annual over the past two and a half decades, driven by growing urban demand and growing incomes (USAID, 2016).

Table 3.3 Major crop production in Myanmar in 2017

Crop	Sown area (acre)	Production
Paddy	17722355	27.16 (mil MT)
Wheat	243603	160.6 (000 MT)
Maize	11343308	1173 (000 MT)
Oil seed crop	8552028	466 (000 MT)
Pulses	11253082	1516 (000 MT)
Cotton	752145	544 (000 MT)
Vegetables	1395674	1411 (000 MT)
Others	11122405	10437 (000 MT)
Net sown area		30792449
Cropping intensity		163%

Source: Ministry of Agriculture and Irrigation

Agriculture has underperformed in Myanmar over the past five decades especially in terms of productivity, equity and stability. Myanmar's agriculture is characterized by low productivity, extreme inequality and high volatility. Low agricultural productivity translates into labor productivity and land productivity where both level of productivity are lower. Farm earnings per worker in Myanmar range between one-half and one-third of the levels in neighboring countries.

The reasons for this vary across products but stem in large part from long-term chronic under investment in agricultural research, weak extension support and limited access to credit.

CHAPTER 4

OVERVIEW OF AGRICULTURAL FINANCE IN MYANMAR

4.1 Agricultural financing in Myanmar

There is a well-recognized gap in agricultural finance sector in Myanmar which has a significant impact on overall productivity. This is particularly problematic because the rural economy suffers from a lack of access to appropriately tailored services which can increase agricultural production. The main financial service provider in Myanmar is the Myanmar Agriculture Development Bank (MADB). Farmers in Myanmar have access to formal financial services through MADB, which provides agricultural loans to farmers based on their ownership of land tenure. Loans are granted for up to 10 acres. According to the latest MADB figures, its coverage reached 2.2 million farmers in 2016, mainly in rice production. However, apart from the specific type of loans granted by MADB, the types of products provided by MADB are extremely limited to meet the needs of the agricultural sector to date.

Another provider of agricultural finance is the Department of Cooperatives (DOC) of the MOAI. It complements MADB by meeting the needs of rural farmers for their agricultural activities. DOC has certain advantages over MADB because its loan conditions are not limited to paddy farmers only; other farmers who produce any profitable crops can also access loan programs, although their eligibility to join cooperative does not require a registration of tenure. In addition, cooperative loans can be used to purchase capital goods, such as agricultural machinery and tools, which other microfinance programs do not always allow. In this perspective, DOC activities complement and support government's agricultural credit programs, as well as private MFIs, although their impact on access to finance is even less than that of other MFIs. MFIs provide farmers with commercial loans to support the advance purchase of agricultural products from farmers while providing loans for the sale of seeds, fertilizer and other inputs. MFIs mainly finance loans to non-agricultural companies and their reach to farmers has been relatively low compared to MADB.

Many obstacles prevent the efficient allocation of access to finance in Myanmar, such as lack of infrastructure, weak institutional capacity, profit-limiting policy constraints, and the dominance of state-owned banks with objectives other than profit (Steel, 2003). Myanmar also lacks other financial offers, such as formal remittance services, insurance markets, equipment leasing, and grain storage, which also contribute to the relative inefficiency of the agricultural sector.

Despite its potential, Myanmar's agricultural sector does not have sufficient financing. In 2016/17, the total amount of credit granted to the rural economy was only 17 trillion kyats; the largest volumes (52.8 percent) were provided by informal moneylenders, other providers, and agricultural input companies. Banks, pawnshops, Microfinance Institutions (MFIs) and cooperatives have been the main providers of formal credit. The banks provided 41.7 percent of the total credit, particularly the state-owned bank, Myanmar Agricultural Development Bank (MADB). Other banks rarely finance smallholder farmers, who dominate Myanmar's agricultural sector. About 98 percent of MADB loans financed agricultural production, while only 2 percent aimed to promote agricultural activities. MFIs provided 0.8 percent and cooperatives provided 0.6 percent (World Bank, 2017)

4.2 Agricultural Financing Institution in Myanmar

4.2.1. Myanmar Agricultural Development Bank (MADB)

The Myanmar Agricultural Development Bank (MADB) is a State-owned bank that succeeded the State Agricultural Bank (SAB) established in 1953, which later became the Myanma Agricultural Bank (MAB) in 1976 and was originally under the Ministry of Finance. Now owned and operated by the Ministry of Agriculture and Irrigation, MADB is the main source of financing for agriculture. There are 12 departments at MADB headquarters and 16 state/divisional offices across the country. It has a relatively large network, with branches in almost two-thirds of Myanmar's 325 townships. State/divisional managers are responsible for all loan disbursement and loan collection functions at the branches under their control.

The MADB law (1990) and supplementary order (1991) clearly stated in Article 5 of the law, which requires MADB to "support the development of agricultural, livestock and rural socio-economic enterprises in the country by providing banking services". However, in practice MADB's business operations are not properly aligned to this objective. The MADB provides financing for a limited

number of crops and does not finance the production of fruits and vegetables. MADB products are designed to support the working capital needs of the customers it serves by covering a fraction of the production cost. MADB charges 5 percent per annum interest on their loans, which is a substantial discount compared to loans by other market players. Prior to 2012, the MADB charged interest rates of between 13 and 18 percent on its loans. During this period, most of the loans were financed with mandatory savings in which the MADB paid 8 percent interest.

MADB offers two types of loans: Seasonal crop production loans (SCPL), typically for working capital, and Term loans (TL), typically for agricultural machinery and special projects. Approximately 98 percent of MADB loans contracted were SCPLs and 85 percent were taken out for monsoon season farming. MADB's lending operations are conducted locally and most are based on collective guarantees instead of being backed by collateral. Approximately 99.9 percent of loans are dispersed using the group lending method. Farmers form groups of 5-10 people and collectively commit to pay back the loan.

Table 4.1: Loan Program of MADB

Seasonal crop production loan	Term loan
S1 Monsoon loan (less than 1 year)	T1 Short-term loan (1-3 years)
(a) paddy	(a) solar salt production
(b) groundnut	(b) sugarcane plantation
(c) sesame	(c) Tea processing
(d) Beans	(d) coffee plantation
(e) Cotton	(e) citronella grass
(f) corn	T2 Farm machinery loan (more than 3 years)
(g) Jute	T3 Special project loan (more than 3 years)
S2 Winter loan (less than 1 year)	
(a) paddy	
(b) Groundnut	
(c) Beans	
(d) Sesame	
(e) cotton	
(f) Corn	

(g) mustard S3 Pre-monsoon loan (less than 1 year) (a) paddy (b) cotton	
--	--

Source: MADB

SCPL is designed to cover the working capital needs of smallholder farmers at the beginning of the agriculture season. Seasonal loans for production of 8 main crops such as paddy, groundnut, pulses, sesame, cotton, jute, maize and mustard are disbursed in three separate seasons; Monsoon, Winter and pre-monsoon. For seasonal loan, farmers have to be grouped into 5 to 10 members and they must accept liability of individual loan and of other group members' loan. No other collateral is necessary. Loan maturity is up to one year and full repayment is expected at harvest time. The loan amount varies according to the number of acres owned or leased by the farmer and the intended crop (Anantavasilpa, 2014).

MADB distributed Short-term loans for sugarcane, and for special projects like salt mining, tea and coffee farming and citronella gas production, as well as some loans for farm machinery and "Special loans" which are executed on behalf of other ministries (UNCDF, 2015).

Farm Machinery Loans was mainly the result of a change in government policy to limit financing for the purchase of locally manufactured machinery. These are individual loans for asset-purchases where the asset is used to collateralize the loan in addition to the cash collateral requirement. Two guarantors are required. Depending on the industry cash collateral, between 30% and 50% of loan value is required as cash collateral (Fujita, 2013). These loans are available to farmers with plots in excess of 10 acres and loans are approved at the MADB head office. The loan term is 3 years and interest are charged at 35% per annum.

Table 4.2: Loan disbursement period and loan collection period

Type of Loan	Loan disbursement period	Loan collection period
S1 Monsoon loan	May-August	Dec- Mar (Following year)
S2 Winter loan	Sep – Jan	Feb – Jun (following year)

S3 Pre-monsoon loan	Jan – Feb	Dec (same year)
T1 Short-term loan		
(a) solar salt production	Oct – Dec	Aug (next year)
(b) sugarcane plantation	Jan- Feb	Feb (next year)
(c) Tea processing	Apr-Jun	Mar (next year)
(d) Coffee plantation	-	-
(e) Citronella grass	Jun-Jul	May (next year)
T2 Farm machinery loan	Any time	3- year loan
T3 Special project loan	Any time	Not available

Source: MADB

MADB provides loans to farmers on a maximum amount per acres basis, up to a maximum of 10 acres, and farmers tend to take the maximum loan amount. The maximum amount per acre has increased significantly over year by year, from 8000 per acre in 2009, to 100000 MMK per acre for paddy and 20000 MMK per acre for other crops in 2013 (UNCDF, 2015).

Table 4.3: Loan size per Acre for Seasonal crop production loan

Agricultural season	Paddy (Kyat/acre)	Other crops (kyat/ acre)
1994-1996	400	70-300
1996-2002	1000	200-2500
2002-2006	5000	1000-3000
2006-2009	8000	3000-4000
2009-2010	10000	6000
2010-2011	20000	10000
2011-2012	40000	10000
2012-2013	(Summer crop) 50000/80000	10000
2013-2014	100000	20000
2016-	150000	50000

Source: MADB

To improve farmer’s access to financial services, the government has allowed them to obtain loans by providing their agricultural land as collateral under the Farm Land Law of March 2011. The government has increased MADB’s maximum loan amount from 20,000 kyat/acre to 80,000 kyat/acre for paddy farmers, as compensation for abolishing governmental subsidies for the purchase of seeds and fertilizers in 2013. In 2016, MADB increased the loans it provided to rice farmers from 100,000 Kyat/acre to 150,000 kyat/acre and 20,000 kyat/acre to 50,000 kyats/acre for other crops.

4.2.2 Microfinance

Microfinance was first introduced in Myanmar in 1997, mainly as an international development assistance activity focused on poverty reduction. In Myanmar, microfinance institutions (MFIs) are concentrated in the urban areas and are currently active in 12 states and divisions (Duflos, 2013) and continue to target the poor, especially landless farmers who cannot receive support from MADB. MFIs are generally group-based in Myanmar and their conditions are strict, require loan term, stipulate regular and frequent payments and require participation in group meetings (Kloeppinger-Todd, 2013).

Until the Microfinance Business law was passed in 2011, MFIs operated without legal status and were governed by memorandums of understanding with the Government of Myanmar. The new law grants licenses to legally registered institutions (local or foreign) for the provision of loan as well as making deposits. Approximately 166 licenses have been issued, including 50 institutions that also provide deposit services in Myanmar (Nehru, 2014). The law also sets interest rates for loans and borrowing, as well as capital limits, establishes certain consumer protections and obliges microfinance banks to comply with the Anti-money laundering/combating the financing of Terrorism (AML/CFT) regulatory guidelines issues by the central bank (Duflos, 2013).

Table 4.4: current licensed microfinance Institutions Implementation status

Type of MFIs	Number
Total license MFIs	215
Deposit taking MFIs	123

Non-deposit taking MFIs	92
Profit taking MFIs	184
Non-profit taking MFIs	30
Microfinance operation areas (state and regions)	15
Microfinance operating townships	201
Microfinance operating wards	1641
Microfinance operating village tracts	2577
Microfinance operating villages	6087
Loan disbursed (Kyat in millions)	288413.00
Saving (Kyat in millions)	35281.87
No. of microfinance borrowers	977,177

Source: Myanmar Microfinance supervisory Enterprise.

This data is valid for only MFIs which registered in Myanmar Microfinance supervisory and cooperatives and state-owned bank, MADB outreach is not counted here. Thus, improving financial access through microfinance will achieve the higher policy objectives for poverty reduction and economic growth.

4.2.3 Other sources of Agricultural Finance

The MADB and MFIs are not the only available tools for agricultural finance. Commercial banks may be able to service larger farmers.

(1) Commercial banks

Myanmar's banking system prospered before the Burma Socialist Programme Party (BSPP) took over and nationalized all private owned banks in 1963. It was not until after the regime of the State Peace and Development Council (SLORC/SPDC) in 1990s, by partially liberalizing the economy through proclamation of the Central Bank Law and the Financial Institutions Law, that private banks resumed operations in the country (Nehru, 2014). However, several "shocks" have undermined public trust in the financial system: two demonetizations in the 1980s, a banking crisis in 2003, the inexplicable closure of government of a large bank in 2005, and a mini-banking crisis in 2012. In 2013, there were 4 state-owned banks, 11 semi-government institutions, 11 fully private domestic banks, and 35 foreign banks representative

offices. The Government of Myanmar has banned foreign-owned banks from establishing branches in Myanmar, although this is being revised as part of Myanmar's integration with ASEAN (Duflos, 2013).

The Central Bank Law of 2013 separated the Central Bank from the Ministry of Finance and placed commercial banks under the regulatory authority of the Central Bank of Myanmar. It remains to be seen if this regulatory independence will provide commercial banks confidence to develop. Another obstacle is the lack of real-time financial data, as reporting between the commercial banks and the central bank is transmitted by facsimile (Nehru, 2014). In addition, the lack of a credit monitoring system obliges banks to rely on strict collateral requirements, which prohibit access to credit for people with few assets.

Commercial banks have so far not played an important role in financing agriculture and tend to focus on urban areas. One reason is that before the Farm Land Law (2012), banks could not accept land as collateral for loans. Upon receiving mandatory certificates in accordance with the Law, commercial banks should, theoretically, be able to increase financing for farmers. However, the increase in operational costs in rural areas and the maximum annual interest rate of 13 percent on loans and the minimum deposits rate of 8 percent can make loans to lower income rural customers a bad investment and to poor and landless clients, lacking in collateral, extremely un-likely. Expansion into rural areas is further hampered by the fact that the MADB, with low interest rates due to subsidies, dominates agricultural loans and is even known to group the inputs of State-Owned Enterprises (SOEs) with loans (Nehru, 2014).

(2) Cooperatives

Cooperatives in Myanmar have a legacy that dates back to the early 1900s and have always been seen as a tool of the government to assert their control (Ferguson, 2013). However, the Government of Myanmar sees cooperatives as a way to help improve socio-economic conditions and microfinance as the main method to achieve 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 that define the activities 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 to register and control their function holders and their procedures, as well as “issue rules and procedures as it sees fit” to implement the law (Ferguson, 2013). The Ministry of Cooperatives is the main supervisory body of cooperatives, while the Department of the Cooperatives is responsible for regulating and approval new cooperatives and also oversees the microfinance services of cooperatives that have not obtained a microfinance license. Cooperatives in Myanmar are organized by the Central Cooperative Society (CCS), which is the central body. It had 20 unions, 461 federations and 10,751 primary societies as of March 2012. Approximately 142 of the societies are financial cooperatives (Duflos, 2013). In September 2013, 68 cooperatives were licensed microfinance. The Union of Savings and Credit Federation is the organizing body for financial cooperatives and also serves as a source of loan to cooperatives and to individuals.

As reported by the CCS, financial cooperatives enjoy high repayment rates. However, the repayment terms may be ill-suited for agricultural loans due to the unevenness of farming income. In most cases financial cooperatives collect payments daily and the loan duration is only 6 months (Duflos, 2013).

With the existence of microfinance law, many institutions have entered the microfinance sector. One of the obvious things is the emergence of cooperative society. According to “consultancy on cooperative system in Myanmar (2014)”, the government of Myanmar plans to create over 500 new cooperatives per year,” with the aim of establishing one cooperative in each village to increase Microfinance Institution (MFI) penetration and reducing poverty. In terms of provision microfinance, cooperatives represent more than half of microfinance organizations and their activities are mainly concentrated in urban areas (JICA, 2013).

Cooperatives has been basically providing financial services to the rural population in the state and regions of Myanmar to respond the needs of local communities, and has effective function has important implication for citizen’s trust in public service provision of the government.

The loan features of cooperatives are only members’ farmers are eligible for loans and credit is used mostly for agricultural production, with the most common crop types being paddy, beans and pulses. However, loans for farm implements are provided on a case by case basis, but require collateral. The loan size varies between 10000 MMK to 50000MMK per acre, with most farm sizes smaller than 10 acres and

typically around 5 acres. Farmers with less than 5 acres are eligible for a loan covering their total acreage, while farmers with between 5 and 10 acres are eligible for a loan covering a maximum of 5 acres and farmers with more than 10 acres are eligible for a loan covering half their acreage. The repayment period depends on the period of production or length of season.

(3) Institutional Sources

Institutional loans are loans granted from both state and non-state sectors through established institutions such as "Mya Sein Yaung", cooperatives and microfinance Institutions, as well as NGOs and non-governmental organizations for the agriculture sector. These loans are granted after the specified procedure and the applicable conditions are met. Formal credit institutions are entangled in their functions by government regulatory controls, interest rate limits, loan ceilings, collateral requirements, high administrative and procedural costs, and subsidized discounts. The loan amounts vary according to the number of acres owned or leased by the farmer and the type of cultivated crops. Moreover, the loan process is complicated and lengthy to release credit, which lead the farmers to the informal credit sources to cover their credit need for cultivation cycle and input needed. The lack of seasonal credit is an important factor that limits the use of inputs, including farmers' access to quality seeds and mechanization services. Therefore, overcoming the credit constraint is clearly another priority to enhance productivity. Although loans through the Myanmar Agricultural Development Bank (MADB) have increased significantly over the past year, supply is still well below demand, while agricultural programs contractual concession credit are also limited. As a result, most of farmers still depend on high-cost informal sources of credit.

(4) Non- Institutional sources

The informal credit market includes local pawnshops, merchants, community organizations, friends and family (Proximity Designs, 2014). These sources of financing are short term and have a higher interest rate or can be determined by mutual agreement. These loans are available for consumption and for the purchase of agricultural inputs. However, the main problem with this type of loan is that it is inappropriate and unreliable. These loans do not have adequate documentation or other rules and regulations, which is why most of the time, farmers face difficulty to

obtain these loans. In addition, data on the amount of disbursements of informal loans are limited. The interest charges on these loans are also higher than the others. However, informal lenders have always played an important role in rural Myanmar in providing better services at a lower cost than the formal sector. In rural areas, the rich have better access to formal sources of credit than poor households because they cannot access adequate formal credit and have to resort to informal lenders.

However, it seems that there are still many problems to be tackled in the agricultural finance sector in Myanmar, as evidenced by the fact that loans from ‘exploitative’ informal sources still persist to the present.

4.3 Agricultural Loan for Mechanization and agricultural inputs

Myanmar has been exploring the use of agricultural machinery of crop cultivation instead of more traditional draught cattle and manpower for agricultural production. The government has implemented agricultural mechanization schemes involving the distribution of agricultural machinery to farmers, the production of suitable agricultural machinery for agricultural land and tilling in planned cropped areas. Agricultural mechanization has saved farmers time, labor, and human energy. Agricultural mechanization has also increased in cropping intensity.

Cropping intensity which also boosted the production of all main crops, increasing rice and pulses. To increase agricultural production, MOAI implemented proper utilization of agricultural inputs such as chemical fertilizers and pesticides, which had been monopolized by Myanmar Agriculture service (MAS) under the MOAI with the inputs. The subsidies were reduced and eventually removed in 1993, and the private sector’s role in the distribution of fertilizer has been encouraged by removing various restrictions. While this has helped to improve supply, it has also generated growing concerns among farmers over fertilizer quality due to the lack of compliance with quality standards under the Fertilizer law. At the same time, the lack of adequate credit and appropriate extension services remained a major constraint on farmers’ ability to use optimum levels of fertilizers.

Table 4.5 Agricultural machinery loan 2011- 2017 (value in thousand)

Equipment	2011	2012	2013	2014	2015	2016	2017
Implements	10573	10962	11 036	11063	11108	11131	11095

Ploughs	3018	3085	3064	3077	3078	3081	3059
Harrows	3126	3182	3200	3196	3211	3217	3200
Spades	4429	4695	4772	4790	4819	4833	4836
Machineries	875	967	992	1002	1022	1029	1041
Seed drills (harrow)	93	94	96	97	98	98	98
Seed drills (plough)	21	23	23	23	23	23	23
Water pump	179	207	232	242	262	267	290
Tractors	11	11	13	14	17	19	27
Vehicles	1795	1769	1776	1769	1763	1758	1742
Carts	1795	1769	1776	1769	1763	1758	1742

Source: Department of Agricultural land management and statistics

4.4 Agricultural Loans for Production

The agricultural sector needs a large injection of financing to modernize and generate revenue for farmers and the country. Mechanization requires financing and poor farmers have little money without access to funds. The main source of financing is the MADB, which disburses loans and, although it has an innovative structure, it cannot meet the financing needs of the large number of farmers. Preference is given to rice farmers and even the funds provided do not cover the total cost of agriculture. The gap and the need are then filled by private and organizations that are part of the informal sector and charge interest on loans up to 20 percent per month. These rates lead to an endless cycle of indebtedness and poor farmers are pushed further into poverty.

However, financing in the agricultural sector is disproportionately lower than the agricultural sector's share of GDP. Seasonal crop loans are provided for different cultivation seasons (pre-monsoon and winter season crops). Medium and long-term loan are provided for the procurement of draught cattle, farm implements and machineries and agricultural development programs for the development of agricultural sector. Input supplies such as fertilizers, agrochemicals and diesel for agricultural machineries are purchased in the domestic market or imported to meet the needs of the farmers. Financing of the purchase of mechanized equipment has also been identified as a constraint to increasing mechanization. The provision of financing in the form of a “term loan” intended to support the purchase of agricultural tools and

equipment that could be used to support mechanized production or process (JICA, 2013).

However, the volume of agricultural financing remains limited and insufficient to meet the enormous financial needs of agricultural sector, even if the people who work in the sector represent more than 68% of the country's total economic population. Myanmar Agriculture Development Bank (MADB) have provided an increasing amount of loans to farmers year by year. The amount of loan provided by agricultural producers from MADB was around five hundred million kyats in 2016. Among the total amount of loan given to farmers, nearly 84% was borrowed by paddy farmers. However, Myanmar Rice Federation implies that at least 200,000 kyat/acre (494,200kyat/ha) is required for the cost of rice production, and MADB also estimates it between 250,000 and 300,000 Kyat/acre (617,700 to 741,300kyat/ha). The JICA survey on 2014 of the Farm Household Economy Survey indicates that an average cost of rice production is 189,244 kyat/acre for monsoon paddy and 185,866 kyat/acre for summer paddy, while the maximum loan granted by MADB to paddy farmers was only 100,000 kyat/acre. It follows that fund provided by MADB fails to sufficiently meet the cost of rice producing farmers.

Table 4.6: Agricultural Financing and agricultural production of Myanmar

FY	Agriculture Loans (Kyat in millions)	% in increased of loan amount	Agriculture production (ton/ac)	% of increase in production
1990	1,616.60	0	13748.3	0
1991	1,524.40	-5.7	12993	-5.5
1992	1,532.90	0.6	14603	12.4
1993	1,758.80	14.7	16495	13.0
1994	2,609.70	48.4	17908	8.6
1995	2,781.10	6.6	17669.6	-1.3
1996	9,013.80	224.1	17397	-1.5
1997	9,919.50	10.0	16391	-5.8
1998	10,500	5.9	16808	2.5
1999	11185.83	6.5	19808	17.8
2000	12124.19	8.4	20986.9	6.0
2001	12740.81	5.1	21569.2	2.8

2002	12015.32	-5.7	21460.7	-0.5
2003	20416.25	69.9	22770.2	6.1
2004	27382.17	34.1	24360.9	7.0
2005	34390.27	25.6	27245.8	11.8
2006	44875.80	30.5	30435	11.7
2007	59627.84	32.9	30954.1	1.7
2008	68970.07	15.7	32058.5	3.6
2009	93489.29	35.6	32165.5	0.3
2010	190679.89	104.0	32065.1	-0.3
2011	352721.75	85.0	28552.1	-11.0
2012	557846.54	58.2	26216.6	-8.2
2013	1158728.58	107.7	26372.1	0.6
2014	1167485.44	0.8	26423.3	0.2
2015	1091404.88	-6.5	26210.3	-0.8
2016	1630623.88	49.4	25672.8	-2.1
2017	1707708.9	4.7	25624.4	-0.2

Source: central Statistical organization

The percentage of agriculture loan was decreased in 1991 to -5.7 and significantly increases in 1996 to 224.1%, because of a Short-Term Four-Year Plan (1992-1996) was formulated with special focus provided to the enhancement of production, especially in agriculture and export industries. The agricultural loan was dramatically increased to 104% in 2010 and 107.7% in 2013, as stated agricultural financing was focus on one of prioritizes area during the fifth 5-years plan of agriculture sector from 2011/12 to 2015/16.

In 2012-13, government has strengthening agricultural financing as priority targeted and the agricultural production has increased as of 0.6%. In 2015, MADB have increased agricultural loan amount for paddy farmer from 100,000 MMK to 150,000 MMK per acre. As a result, agricultural loan in 2016 have increased to 49.4%, however, the production was decreased as of -2.1% due to heavy flooded in that year cause loss of agricultural production.

4.5 The relation of agricultural financing and agricultural production

Qualitative method has been applied to study the relationship of agricultural financing and agriculture productivity. The data was processed and analyzed using the Statistical Package for Social Sciences (SPSS). The analysis of the impact of agricultural loan on agricultural productivity is obtained through Pearson's regression test. The Pearson correlation coefficient, also referred to as Pearson's r , the Pearson product-moment correlation coefficient or the bivariate correlation, is a measure of the linear correlation between two variables X , *agricultural loan* and Y , *agricultural production*. According to the Cauchy–Schwarz inequality it has a value between +1 and -1, where 1 is total positive linear correlation, 0 is no linear correlation, and -1 is total negative linear correlation. In 1896, Pearson published his first rigorous treatment of correlation and regression in the *Philosophical Transactions of the Royal Society of London*. In this paper, Pearson credited Bravais (1846) with ascertaining the initial mathematical formulae for correlation (Stanton, 2001). Pearson demonstrated that optimum values of both the regression slope and the correlation coefficient could be calculated from the product-moment, $\sum xy/n$, where x and y are deviations of observed values from their respective means and n is the number of pairs. Differences in variability between the two variables influence the slope of the regression line but not the level of association between the variables. Assuming that r is known or can be estimated, the slope can be calculated by multiplying r by (S_y / S_x) .

Pearson's approach to the calculation of r by first demonstrating that the product-moment – the mean of the cross products of the deviations of X and Y – provides the most accurate prediction of y scores from x scores.

The modern notation of the regression equation, $Y = b X + a$, show that the value for r , adjusted by multiplying by the expression (S_y / S_x) , provides the formula for b , the regression slope. The Pearson product-moment correlation does not take into consideration whether a variable has been classified as a dependent or independent variable. It treats all variables equally.

Therefore, Regression model is used to analyze the impact of agricultural loan on agricultural productivity in this study.

Table 4.7: Regression correlations between agricultural loan and agricultural production

correlation		Agricultural Loan	Production
Pearson Correlation	Agricultural Loan	1.000	.324
	Production	.324	1.000
Sig. (1-tailed)	Agricultural Loan	.	.046
	Production	.046	.
N	Agricultural Loan	28	28
	Production	28	28

Source: survey data

Table 4.7 show on agricultural loan has positive impact on agricultural productivity although it not very high. 1 percent of agricultural loan will bring increase in 0.324 percent in production, which indicates positive correlation, but the effect is small.

The correlation between agricultural loan and agricultural production is also highly significant in 1-tailed significance value-which in this case is 0.046. The standard value is 0.05, which means that the correlation is highly significant between agricultural loan and agricultural production.

When Pearson's correlation r is close to 1, this means that there is a strong relationship between the two variables. This means that changes in one variable are strongly correlated with changes in the second variable. In the correlation between agricultural loan and agricultural production, Pearson's r is 0.324, which is positive but not very close to 1. For this reason, the analysis can conclude that there is a positive relationship between agricultural loan and agricultural production but not very strong relationship. The changes on agricultural loan have not strongly correlated with the changes in agricultural production with small impact. The Pearson's r is positive value, this means that one variable increases in value, the second variable also increase in value. This is called a positive correlation. In this study, Pearson's r value of 0.324 was positive. This can conclude that when the amount of agricultural loan increases, the amount of agricultural production also increases.

CHAPTER 5

CONCLUSION

5.1 Findings

The study determined the effect of agricultural financing on agricultural production during the period from 1990 to 2017. The implication is that the loan granted to agricultural sector has consequential positive effects on Agricultural production during the period. The study concluded that when the amount of agricultural loan increases, the amount of agricultural production also increases. The result has shown that agriculture financing is an appropriate political strategy to stimulate sustainable economic growth by increasing agricultural production.

Myanmar has great potential to expand the agricultural financing opportunities in the country, although there are many obstacles that stand in the way of a strong and dynamic agricultural financing industry. The provision of agricultural financing is primarily managed by MADB, which emphasizes on landlords and loan size restrictions make this source of credit inappropriate or inaccessible to many. In addition, the low interest rates of MADB affect the competitiveness of other loan options and lead to dependency on subsidized loans. Myanmar should consider reforming the MADB operations and promoting the variety of credit options.

Currently, the responsibility for financing agriculture lies primarily with the Myanmar Agricultural Development Bank (MADB) and, in some cases, with certain government-related banks. The coverage was very low and the purchase of agricultural loans depended largely on loans to the Myanmar's Economic Bank. This means that the current MADB loan program for agriculture is inappropriate in the long term.

Although, government have increased agricultural financing year by year, the volume of agricultural financing remains far behind to meet the financial needs of agricultural sector. The agricultural loan providing are failed to cover the total sown area and the cost of agricultural production. Moreover, agricultural loans are short term and have fixed repayment periods which is not suitable for annual production.

5.2 Suggestions

In view of the findings of the study, the following recommendations have been suggested:

Agricultural financing has allowed farmers to access more loans, which can increase access to agricultural land to increase agricultural productivity. Therefore, the government should find potential options to increase agricultural loans that can increase farmers' access to sown area to increase agricultural productivity.

Financial innovation to meet the needs of the rural sector should not be limited to financial institutions. The government can play a proactive role in promoting laws and regulations with new financial instruments, or even encouraging existing instruments, to raise awareness of the financial and agricultural sectors. Specialization in financing agriculture in government and the financial sector is an important driver of their development.

Land titling and land registries to permit farmers to collateralize land into credit. Land-collateralized credit may need to be paired with explicit credit insurance to allow borrowers to avoid 'risk rationing' on the demand side. Providing agricultural insurance to banks is not sufficient if the banks do not extend this conditionality explicitly in their loans.

The government should strengthen the agricultural credit guarantee scheme with a significant budgetary allocation to enhance its capital base significantly. Also, the government must make deliberate efforts to increase agricultural spending by increasing its financial subsidies to agricultural firms and small-scale farmers. In order to enable the agricultural productivity to take full advantage of the various opportunities and cope with challenges, credit to agricultural sector must be adequately funded.

There is need to enhance the targeting, flows and impact of micro-credits to small-scale farmers in Myanmar. Government and private led micro credit initiatives (MADB, Cooperatives banks and MFIs, etc) need to be reformed and scaled up and attention must be paid to providing innovative types of small-scale agricultural finance for agricultural development. The reformation should start with the consolidation of all the specialized agricultural financing mechanisms and institutions into one efficient and effective bank and insurance dedicated to agricultural development and farmers of all scales.

Microfinance sector should be developed. There is a need to increase the portfolio of agricultural loans through these institutions, the obstacles to the free flow of credit to the agricultural sectors (including the inability of farmers to repay, the diversion of funds by farmers, and the loss of huge resources), can be overcome if farmers, bankers and the government work to make agricultural financing for banks attractive and at the same time favorable to farmers. This requires the development of innovative and holistic micro and middle products. These innovations should be able to address the shortcomings of previous agricultural finance programs, not only in terms of economic growth, but also in terms of contributing to sustainable development and poverty reduction. Therefore, the coverage of MFIs accessible to farmers should be increased.

Even with the recent increase in the level of credit available to farmers, formal sector loans through the MADB still meets only a small part of total demand. A significant expansion in rural credit will be needed both short-term seasonal credits and medium to long term credit for agriculture to take off rapidly.

Government policies for effective and efficiency use of credit for the agricultural sector should be reformed to make the most of it to improve agricultural production, generate more income, create job opportunities and also boost agricultural production.

Finally, it can be concluded that Agricultural financing is a necessary input for inclusive agricultural sector growth. Therefore, it is recommended on the subsistence of government policy should embark on diversification and enhance more allocation in terms of budgeting to the agricultural sector.

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APPENDIX

REGRESSION

```

/DESCRIPTIVES MEAN STDDEV CORR SIG N
/MISSING LISTWISE
/STATISTICS COEFF OUTS R ANOVA ZPP
/CRITERIA=PIN(.05) POUT(.10)
/NOORIGIN
/DEPENDENT Agri_Loan
/METHOD=ENTER Production.
    
```

Regression

Output Created	21.11.2019, 13:46:28	
Comments		
Input	Data	
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	28
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax	REGRESSION /DESCRIPTIVES MEAN STDDEV CORR SIG N /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA ZPP /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Agri_Loan /METHOD=ENTER Production.	
Resources	Processor Time	0:00:00.015
	Elapsed Time	0:00:00.031
	Memory Required	1620 bytes
	Additional Memory Required for Residual Plots	0 bytes

Descriptive Statistics

	Mean	Std. Deviation	N
Agri_Loan	296274.060	527345.6446	28
Production	23034.443	5963.6419	28

Correlations

		Agri_Loan	Production
Pearson Correlation	Agri_Loan	1.000	.324
	Production	.324	1.000
Sig. (1-tailed)	Agri_Loan	.	.046
	Production	.046	.
N	Agri_Loan	28	28
	Production	28	28

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	Production ^a	.	Enter

a. All requested variables entered.

b. Dependent Variable: Agri_Loan

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.324 ^a	.105	.071	508317.4777

a. Predictors: (Constant), Production

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.905E11	1	7.905E11	3.059	.092 ^a
	Residual	6.718E12	26	2.584E11		
	Total	7.509E12	27			

a. Predictors: (Constant), Production

b. Dependent Variable: Agri_Loan

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-364612.355	389870.037		-.935	.358
	Production	28.691	16.404	.324	1.749	.092

a. Dependent Variable: Agri_Loan

Coefficients^a

Model		Correlations		
		Zero-order	Partial	Part
1	(Constant)			
	Production	.324	.324	.324

a. Dependent Variable: Agri_Loan