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**A STUDY ON OBSTACLES OF
SMALL-SCALE PADDY FARMERS IN DRY ZONE**

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EMDevS – 75 (14th Batch)

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A STUDY ON OBSTACLES OF
SMALL-SCALE PADDY FARMERS IN DRY ZONE

**A thesis submitted in partial fulfillment of the requirement for the
Degree of Master of Development Studies.**

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ABSTRACT

This study focused on obstacles faced by small-scale paddy farmers in Taungtha Township which is located in Dry Zone. This study used descriptive method and is cross-sectional study. It targeted the farmers in the Taungtha township, who possess five acres of farm land maximum and cultivated the paddy since last three years at least, to explore their major obstacles via the questionnaire. This study has learnt that farmers in the area are threaten mostly by scarcity of labour, lack of finance, poor quality of distribution channels and price of inputs. They are associated with migration, low wage for labour, limited credit, behavior and practices of farmers engaging the market. Farmer groups should be formed not only to share their knowledge and experience but also to balance power relation when they deal with their stakeholders. Government should prioritize agricultural spending in public budget and encourage private sector participation in agricultural sector. Private sector should prioritize their investments that contribute to the success of the small-scale paddy farmers rather than marginalizing them.

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TABLE OF CONTENTS

ABSTRACT	i
ACKNOWLEDGEMENTS	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	v
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
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 Organization of the Study	3
CHAPTER II: LITERATURE REVIEW	5
2.1 Historical Perspective of Agricultural Development	5
2.2 Agricultural Economic Theory	6
2.3 Role of Agriculture in The Economic Development of a Country	7
2.4 Defining Small-Scale Farmers	10
2.5 Role of Small-Scale Farmers in Agricultural Development	11
2.6 Constraints Facing by Small-Scale Farmers	11
CHAPTER III: AGRICULTURAL SECTOR IN MYANMAR	18
3.1 Background	18
3.2 Myanmar Agricultural Policy Changes	20
3.3 Share of Agricultural Sector in GDP	22

3.4	Agricultural Sector in the Government Expenditure	23
3.5	Land Utilization	24
3.6	Paddy Cultivation	25
3.7	Inputs	26
3.8	Agricultural Loans	28
3.9	Agricultural Equipment	30
3.10	Contribution of Agricultural Sector in Export Earnings	32
3.11	Characteristic of Dry Zone	34
3.12	Socio-Economic and Agricultural Statistic of Mandalay Region	35
CHAPTER IV: SURVEY STRATEGIES		37
4.1	Survey Profile	37
4.2	Survey Method	43
4.3	Survey Result	44
4.4	Summary of Survey Data Analysis	58
CHAPTER V: CONCLUSION		61
5.1	Findings	61
5.2	Suggestions	63
REFERENCES		64
APPENDIX		70

LIST OF TABLES

Table 3. 1:	Major agro-climatic zones in Myanmar	19
Table 3. 2:	Gross Domestic Product at constant price by sector of activity	22
Table 3. 3:	Expenditure for Agricultural Sector in Union Government Budget	23
Table 3. 4:	Area classified by type of land	24
Table 3. 5:	Land utilization of net area sown	25
Table 3. 6:	Sown acreage, harvested acreage and production of cereal crops	25
Table 3. 7:	Utilization of fertilizer	26
Table 3. 8:	Distribution of quality seeds for cereal crops	27
Table 3. 9:	Pesticides used for paddy plant protection	27
Table 3. 10:	Agricultural loans by crop	28
Table 3. 11:	Agricultural loans by States and Regions	29
Table 3. 12:	Agricultural equipment	30
Table 3. 13:	Distribution of wheel tractors by station	31
Table 3. 14:	Distribution of tractors by stations in Mandalay Region	32
Table 3. 15:	Export by type of principle commodities	33
Table 3. 16:	Direction of rice export trade	34
Table 4. 1:	Temperature record of Taungtha township	37
Table 4. 2:	Rain fall record of Taungtha township	38
Table 4. 3:	Self-sufficiency ratio for rice cultivation in Taungtha township	39
Table 4. 4:	Land utilization by type (2017)	40
Table 4. 5:	Farmer households and their farmlands status by type (as of March, 2019)	40
Table 4. 6:	Farmer households and their farmland by range of land ownership (as of March, 2019)	41

Table 4. 7:	Status of monsoon paddy cultivation in 2018-2019 (as of Sep 2019)	41
Table 4. 8:	Paddy cultivation by variety and financial years	42
Table 4. 9:	Respondents by village	44
Table 4. 10:	Age and education level of participant	45
Table 4. 11:	Land ownership of participant in 2019	46
Table 4. 12:	Land ownership of participant in 2019 (by type and water sources)	46
Table 4. 13:	Comparison of cultivated area and average yield per acre between current year and last three years	47
Table 4. 14:	Comparison of average cost and income per acre between current year and last three years	48
Table 4. 15:	Technology usage for cultivation and threshing	48
Table 4. 16:	Technologies used for paddy cultivation	49
Table 4. 17:	Sources of technologies transferred	49
Table 4. 18:	Appropriateness of and willingness to technologies	50
Table 4. 19:	Accessibility to quality seeds and purchasing pattern	51
Table 4. 20:	Sources for agricultural loan	51
Table 4. 21:	Farmers' expression on loan from government	52
Table 4. 22:	Paying back the loan by income from paddy cultivation	52
Table 4. 23:	Coping mechanism for outstanding loan	53
Table 4. 24:	Major income sources for small-scale farmers	53
Table 4. 25:	Market, buyers and price	54
Table 4. 26:	Output utilization, market and marketing channels	55
Table 4. 27:	Labour availability	56
Table 4. 28:	Obstacles expressed by respondents	56
Table 4. 29:	Root causes expressed by respondents	57

LIST OF FIGURES

Figure 4. 1: Obstacles expressed by respondents

57

LIST OF ABBREVIATIONS

AP	Asia Pacific
ASEAN	Association of South-East Asian Nations
ATS	Agriculture Tractor Station
CSO	Central Statistics Organization
DALMS	Department of Agricultural Land Management and Statistics
DBSA	Development of Bank of Southern Africa
FAO	Food and Agriculture Organization
GAP	Good agricultural practices
GDP	Gross Domestic Product
HH	Household
Lao PDR	Lao People's Democratic Republic
LIFT	Livelihoods and Food Security Multi-Donor Trust Fund
M.T	Metric ton
MADB	Myanma Agricultural Development Bank
MAPT	Myanmar Agricultural Produce Trading
MIMU	Myanmar Information Management Unit
MMK	Myanmar kyat
NLD	National League for Democracy
Oxfam GB	Oxfam Great Britain
SLORC	State Law and Order Restoration Council
SOAS	School of Oriental and African Studies
SPDC	State Peace and Development Council
SPS	Sanitary and phytosanitary
USD	United States dollar
WFP	World Food Programme

CHAPTER I

INTRODUCTION

1.1 Rationale of the Study

Myanmar is one of Asia's last frontier markets, promising to become the next South-East Asian rising star. After years of isolation, the country opened up in 2011 and implemented substantial reforms that established the fundamental basis for the real development of the country. The average annual growth Myanmar's GDP is now between six and seven percent, making it one of the highest in Asia and in the World. The country will continue to develop at a similar pace in the future, thanks to its many resources, thus offering a great potential for companies investing and operating in the country.

In Myanmar, over 14.8 million people are living in urban area while over 35.4 are living in rural area. It can be clearly seen that 70 percent of the total population is residing in rural areas (Department of Population, Report of the 2014 Union of Myanmar Population and Housing Census, 2014). Out of total population, over 42 percent is engaged in agriculture which means that the majority of rural people rely mainly on farming (Department of Population, Report of the 2014 Union of Myanmar Population and Housing Census, 2014). Therefore, agriculture stands as mainstay amongst others in rural development and it can be simply mentioned that the development in agricultural sector enhances the socio-economic development of rural area as it is a prime source of rural income and food security in particular, and the country as a whole.

Among the economic activities in fiscal year 2017 – 2018, agricultural sector represented 25.8 percent of GDP (CSO, Myanmar Statistical Yearbook 2018, 2018). In financial year 2017 – 2018, total value of agricultural export was about USD 1324 million and among them, rice and rice product were about USD 504 million (CSO, Myanmar Statistical Yearbook 2018, 2018). The 2014 Myanmar Population and

Housing Census shows that Myanmar still depends on a basically agrarian economy. More than 40 percent of all employed people were working in skilled agricultural, forestry and fishery occupations (CSO, Myanmar Statistical Yearbook 2017, 2017). The Census clearly shows that the primary (agricultural) sector in which the most people are employed is also the poorest. Rice paddy remains the dominant production crop, accounting for 92 percent of the harvested area and 93 percent of production value amongst major cereal crops in Myanmar during the financial year 2017 – 2018 (CSO, Myanmar Statistical Yearbook 2018, 2018). While rice has also been historically the major agricultural export, contributing USD 1,324 million in the financial year 2017 – 2018 (CSO, Myanmar Statistical Yearbook 2018, 2018).

Not only majority of population are living at the rural area but also the country still depends on agrarian economy. In addition, agriculture is still the primary source for creating employment opportunities the labour force. On the other hand, scholars say that Myanmar has richness in resources and having a strategic location, agriculture has underperformed in Myanmar over the past five decades. Myanmar contains three main agro-ecological zones: the delta (which includes the coastal zone), the central Dry Zone, and the hilly regions This study is carried in Taungtha township, which is in Dry Zone where is the second largest agro-econological zone in Myanmar. Most of the farmers in the Taungtha township are small-scale farmers. Although it is gradually improved, Taungtha is still having problem with its self-sufficiency on rice production. They still need to import the rice from lower parts of the country. Even though there is big demand on the rice in local market, paddy cultivation is considerably low in the township. Understanding on the obstacles faced by paddy specialized small-scale farmers in the township could help to map out challenges of paddy specialized small-scale farmers in the country and then finding long lasting solutions. Hence, this study came out.

1.2 Objectives of the Study

This study intends to examine major obstacles which threaten small-scale farmers in Dry Zone who specialize in paddy cultivation. This study will also examine access to resources, yield per acre, cost and income per acre of small-scale farmers in order to support the exploring major obstacles which threaten small-scale farmers in the region.

1.3 Method of Study

The method of this study is descriptive and cross-sectional study based on primary data. Secondary data collected from books departmental records, technical reports, papers of state and international organizations and agricultural journals was used to obtain necessary statistics.

1.4 Scope and Limitations of the Study

This study emphasizes on obstacles being faced by small-scale farmer in Taungtha Township, Mandalay Region, Dry Zone who specialized in cultivation of paddy crop. To compare the situations in the past and at now, the survey targets to the farmers who possess farm land up to five acres and they have cultivated paddy since last three years at least. Moreover, some paddy farmers from some villages in the targeted area could not cultivate the paddy due to the scarcity of water and they had to choose other crops to cultivate that year. It was mostly happened in rain-fed areas, irrigated from dam/pond areas. This effects on sampling for this study and the survey team had to choose the villages from the areas where is irrigated by river water pumping. Based on those criteria and given the space of the budget, the survey was run in four villages. International scholars say that small-scale farmers in developing countries are facing the challenges relating to climate, technology and education, financing and infrastructure. So that questionnaire was developed based on these four areas. This study asked the questions to the farmers in Taungtha township who possess five acres of farm land maximum and has cultivated paddy since last three years at least.

1.5 Organization of the Study

The organization of this study consists of five chapters. Chapter 1 introduces about the study which consists rationale, objectives, methods, scope and limitation of the study. Chapter 2 presents literature review related to role of agriculture in economic development and role of small-scale farmers in agricultural development. It also includes historical perspective of agricultural development, agricultural economic theory, definition small-scale farmers in international scholars and constraints facing by small-scale farmers. Chapter 3 is consisted of role of agriculture in Myanmar, profile of Myanmar and Myanmar agricultural policy changes. It also presents about overview

on current situation of agricultural sector in Myanmar. General information of Taungtha township, overview on its economic status, agricultural assets, rice self-sufficiency ratio, land utilization, status paddy cultivation and obstacles of paddy specialized small-scale farmers in the township are organized into Chapter 4. In Chapter 5, findings of the study are presented together with suggestions to lessen the issues.

CHAPTER II

LITERATURE REVIEW

2.1 Historical Perspective of Agricultural Development

The historical progression of agricultural development can be broadly broken into four distinct periods, marked by three “revolution” in production technology and social institution. First, from the time that men first appeared on earth, human beings hunted and gathered their food. Hunter-gatherer societies typically lived in small groups, experienced little population growth. Then, more than ten thousand years ago, a combination of climate changes and others created conditions for the development of settled agriculture. In the Middle East and elsewhere, people began to collect and cultivate the seeds the plants that eventually became modern barley, wheat, and rye. This development is known as the first agricultural revolution, and permitted a slow but significant increase in human population density. (Carr, 2017)

More recently, a few hundred years ago, rising population density and opportunities for trade led to a second agricultural revolution. In North-western Europe and elsewhere, farmers developed crop rotations and livestock management systems that permitted rapid growth in output per person, fueling the industrial revolution and the eventual mechanization of many important tasks (Bayer US, 2018). Finally, in the late nineteenth and early twentieth centuries, scientific breeding, chemical fertilizer, and other innovations allowed rapid increases in output per unit of area (Bayer US, 2018). The spread of their biological technologies to developing countries, known as the green revolution, has been a powerful engine of economic growth and poverty alleviation, allowing low-income people to produce more food at lower cost than ever before. (George W. Norton; Jeffrey Alwang; William A. Masters, 2010)

The historical trends played out at different speeds and in different ways across the globe. A few people in the poorest countries still devote substantial energy to hunter-gatherer activities, and many millions of farmers still cultivate the same seeds

in the same ways as their ancestors (George W. Norton; Jeffrey Alwang; William A. Masters, 2010). Because of population growth, these techniques and institutional arrangements yield less and less output over time. The development and spread of higher-productivity systems to suit these people's needs is among the major humanitarian challenges of our time. (George W. Norton; Jeffrey Alwang; William A. Masters, 2010)

2.2 Agricultural Economic Theory

Diminishing returns to capital was stressed by Solow model in the mid twentieth century. The importance of diminishing returns to labour was stressed by the classical model of economic growth as a constraint to growth. Contemporary experience, however, shows how countries with institutions that reward innovation can sustain rapid economic growth far beyond these constraints. (George W. Norton; Jeffrey Alwang; William A. Masters, 2010)

Growth-stage theories tried to classify the growth process into successive steps through which countries must pass as they develop. Dual-economy models targeted on flow of labour out of agriculture and the transformation of agriculture can be continued by balanced growth in the both sectors. Dependency theorist argued that developing countries became increasingly exploited as they become more integrated into world markets, and so should withdraw into self-sufficiency (George W. Norton; Jeffrey Alwang; William A. Masters, 2010). Each of these theories give some insights into the development process, but does not provide a completed theory of growth and development.

The role of agriculture is recognized by contemporary development strategies as an engine of economic growth. Agricultural growth free up labour and other resources that can be used in other sectors. It helps alleviate poverty by improving food availability and stimulating broad-based employment growth. (George W. Norton; Jeffrey Alwang; William A. Masters, 2010) Most economics acknowledge that international trade should be relatively open, and government should encourage innovation, administer monopolies, provide public goods and facilitate markets more efficient. The explicit development strategy for a country depends on its stage of development, resource mix and institutional structure. New institutional settlement will have to be engineered in many countries to build up information flow and lower

transactions cost, to facilitate markets more efficient and promote accountability in the public and private sectors. (George W. Norton; Jeffrey Alwang; William A. Masters, 2010)

Expansion or conservation of resources, diffusion, use of high-payoff inputs, and induced innovation are some of the several theories of agricultural development. Technical and institutional changes are key factors of any operational agricultural development strategy. Relative price changes resulting from change in resource endowments and product demand induced those changes. Agricultural sector may not follow an economically efficient development path because of transaction costs, collective action and the realities of human behavior. In the presence of transactions costs and collective action, the distribution of assets has important implications. If land is distributed unequally, then the demands on technologies, inputs, policies etc. of a producers' group are unlikely the same with those of others because of transactions cost. The development process from its optimal path can be pulled by collective action. Institutional changes to improve information flows and constrain exploitive behavior can become critical to agricultural development. (George W. Norton; Jeffrey Alwang; William A. Masters, 2010)

2.3 Role of Agriculture in The Economic Development of a Country

Agricultural sector plays a strategic role in the process of economic development of a country. It has already made a significant contribution to the economic prosperity of advanced countries and its role in the economic development of less developed countries is of vital importance. In other words, where per capita real income is low, emphasis is being laid on agriculture and other primary industries. (Biljana Ciglovska, 2018) Industrial and agricultural developments are not alternatives but are complementary and are mutually supporting with respect to both inputs and outputs. It is seen that increased agricultural output and productivity tend to contribute substantially to an overall economic development of the country, it will be rational and appropriate to place greater emphasis on further development of the agricultural sector (Pragyandeepa, n.d).

According to Prof. Kinderberger, Todaro, Lewis and Nurkse etc., agriculture makes its contribution to economic development in several ways, (John, 2018):

- (1) By providing food and raw material to non-agricultural sectors of the economy,
- (2) By creating demand for goods produced in non-agricultural sectors, by the rural people on the strength of the purchasing power, earned by them on selling the marketable surplus,
- (3) By providing investable surplus in the form of savings and taxes to be invested in non-agricultural sector,
- (4) By earning valuable foreign exchange through the export of agricultural products,
- (5) Providing employment to a vast army of uneducated, backward and unskilled labour. As a matter of fact, if the process of economic development is to be initiated and made self-sustaining, it must begin for agricultural sector.

The agricultural sector is the backbone of an economy which provides the basic ingredients to mankind and now raw material for industrialisation. The lessons drawn from the economic history of many advanced countries tell us that agricultural prosperity contributed considerably in fostering economic advancement. Agriculture is the basic source of food supply of all the countries of the world—whether underdeveloped, developing or even developed. If agriculture fails to meet the rising demand of food products, it is found to affect adversely the growth rate of the economy. Raising supply of food by agricultural sector has, therefore, great importance for economic growth of a country. (Muharram Macatta, 2016) Agricultural advancement is necessary for improving the supply of raw materials for the agro-based industries especially in developing countries. The shortage of agricultural goods has its impact upon on industrial production and a consequent increase in the general price level. It will impede the growth of the country's economy. The progress in agricultural sector provides surplus for increasing the exports of agricultural products. In the earlier stages of development, an increase in the exports earning is more desirable because of the greater strains on the foreign exchange situation needed for the financing of imports of basic and essential capital goods. Agriculture absorbs a large quantity of labour force. Agricultural progress permits the shift of manpower from agricultural to non-agricultural sector. In the initial stages, the diversion of labour from agricultural to non-agricultural sector is more important from the point of view of economic development as it eases the burden of surplus labour force over the limited land. Thus, the release of

surplus manpower from the agricultural sector is necessary for the progress of agricultural sector and for expanding the non-agricultural sector. The development of agriculture requires roads, market yards, storage, transportation railways, postal services and many others for an infrastructure creating demand for industrial products and the development of commercial sector. The development of agricultural sector has minimized the burden of several developed countries who were facing the shortage of foreign capital. Agricultural sector requires less capital for its development thus it minimizes growth problem of foreign capital. In a country which is predominantly agricultural and overpopulated, there is greater inequality of income between the rural and urban areas of the country. The prosperity of agriculture would raise the income of the majority of the rural population and thus the disparity in income may be reduced to a certain extent. (Praburaj L., 2018) Development of agricultural sector is also relevant on political and social grounds. The development of agricultural sector would tend to increase the purchasing power of agriculturists which will help the growth of the non-agricultural sector of the country. It will provide a market for increased production. During depression, industrial production can be stopped or reduced but agricultural production continues as it produces basic necessities of life (Pragyandeepa, n.d). Thus, it continues to create effective demand even during adverse conditions of the economy. Most of the developing countries of the world are exporters of primary products. Thus, the capacity to import capital goods and machinery for industrial development depends crucially on the export earning of the agricultural sector. Agricultural sector provides funds for capital formation in many ways as: i) agricultural taxation, ii) export of agricultural products, iii) collection of agricultural products at low prices by the government and selling it at higher prices. iv) labour in disguised unemployment, largely confined to agriculture, is viewed as a source of investible surplus, v) transfer of labour and capital from farm to non-farm activities etc. (Pragyandeepa, n.d) Agriculture provides employment opportunities for rural people on a large scale in underdeveloped and developing countries. It is an important source of livelihood. The rising agricultural surplus caused by increasing agricultural production and productivity tends to improve social welfare, particularly in rural areas. The living standard of rural masses rises and they start consuming nutritious diet including eggs, milk, ghee and fruits. They lead a comfortable life having all modern amenities—a better house, motor-cycle, radio, television and use of better clothes. Increase in agricultural productivity leads to increase in the income of rural population which in turn leads to more demand

for industrial products, thus development of industrial sector (SOAS University of London, n.d). Agricultural development is a must for the economic development of a country.

2.4 Defining Small-Scale Farmers

There is no unique and unambiguous definition of small-scale farmers. Different indicators have been identified in order to define small-scale farmers. Land ownership is one of them. Limited access to land is the common identification feature, when the term small-scale is mentioned in the literature or elsewhere. The limit, most frequently takes the form of a threshold that is usually selected in an ad hoc basis (2 hectares, mean or median land size). For example, households with less than a threshold land size of two hectares may be characterized as small-scale farmers. However, across countries, the distribution of farm sizes depends on many other factors such as agro-ecological and demographic conditions and economic and technological factors. For instance, employs farm size as the classification variable, and defines small-scale farmers as farmers with operated farm size smaller than 10 hectares and greater than 0.1 hectares (“virtually landless”) (Food and Agriculture Organization, 2017).

A range of other dimensions are important attributes of scale in defining small-scale farmers. Among these attributes, geographical attributes, access, use and ownership of capital, livestock and inputs (including credit) are crucial, define small-scale farmers in a similar way in six Sub-Saharan countries (Harriet Mugeru & Panagiotis Karfakis, n.d) and provide useful reviews on the evolution of farm size. Moreover, other attributes such as land fragmentation or differentiation between land ownership and use are important characteristics that affect scale in agriculture. Another form of farm typology reflects on agro-ecological characteristics such as climate, farmland related factors and the crop and livestock systems used along with other economic factors. Finally, a set of farm typologies employed by FAO (Douglas J. McConnell & John L. Dillon, 1997), addresses attributes reflecting on the operational objective of the farm and its degree of independence along with its size. The operational objectives of the farm, stemming from the principal purpose of welfare maximization, are achieved through self-sufficiency and/or the generation of some amount of cash income, while the number and the types of crops cultivated are also considered. (Harriet Mugeru & Panagiotis Karfakis, n.d)

2.5 Role of Small-Scale Farmers in Agricultural Development

Small-scale farmers play an important role in the dilemma of feeding our world. Currently small-scale farmers produce the majority of food for the developing world. (The Borgen Project, 2013) Small-scale agriculture is the production of crops and livestock on a small-piece of land without using advanced and expensive technologies. It plays a dual role of being a source of household food security as well as income from sale of surplus. Although some claim small-scale agriculture is less efficient in output as compared to commercial agriculture, it is ecologically friendly in that less land is cleared for cultivation, there are less emissions due to less use of fuel-driven machinery and the market is usually local implying less carbon miles. On the other hand, permaculturalist and others claim that per unit of area small-scale agriculture is far more productive than commercial agriculture in terms of total output from the piece of land. (Ngopulse.org, 2012) Economically, small scale agriculture enhances local economic development as it is a source of employment and keeps most of the income local as the market is predominantly localized. Socially, especially on traditional lands, the produce is first meant to feed the household thereby contributing to food security (Kutya, 2012).

2.6 Constraints Facing by Small-Scale Farmers

Small-scale farmers face a number of constraints, which increase risk and uncertainty and act as disincentives for increased production, consequently preventing them from accessing agricultural markets. Generally, small-scale farmers in developing countries face major challenges such as poor access to land; lack of on-farm and off-farm infrastructure; lack of access to finance for production inputs; lack of access to mechanization, transport logistics, extension and research support services; and limited access to high-value markets (Baloyi, 2010). According to the Development Bank of Southern Africa (DBSA, 1986), common constraints facing small-scale farmers in less-developed areas may be classified into two groups, namely external and internal constraints. External constraints emanate from the broader agricultural environment and are largely beyond the control of the individual farmer. These include natural risks typical to agricultural activity; limited availability of inputs, credit, mechanization, and marketing services; poor institutional and infrastructural support; inappropriate policies and legislation; restrictive administrative and social structures; and problems associated with land tenure and the acquisition of agricultural resources. Internal constraints are

those constraints that affect the farmer's ability to operate efficiently, despite any innate potential the farmer might have to allocate resources in an economically efficient manner. Normally the farmer has some control over such constraints. These include liquidity problems; shortage of labour; lack of skills, knowledge and education; and a range of cultural factors that in some instances prevent more effective management of resources. The removal of these constraints will assist the farmer to allocate resources in an economically optimal manner. (Baloyi, 2010)

Small-scale farmers find it difficult to compete in the new market environment. They face enormous constraints when it comes to physically accessing markets. They also lack market information, business and negotiating experience, and a collective organization to give them the power they need to interact on equal terms with other – generally larger and stronger – market intermediaries. The result is poor terms of exchange and little influence over what they are offered (Heinemann, 2002).

Small-scale farmers are often illiterate, with poor technological skills, which can be serious obstacles in accessing useful formal institutions that disseminate technological knowledge (Baloyi, 2010). The majority of emerging producers are not capacitated with financial and marketing skills and are unable to meet the quality standards set by fresh produce markets and food processors. Lack of production knowledge leads to lower quality in production.

Poor access to land, labour force and capital affects the way in which small-scale farmers can benefit from opportunities in agricultural markets, and especially in terms of the volume of products traded and the quality of those products (Bienabe, E., Coronel C., Le Coq, J. & Liagre, L., 2004). Small-scale farmers lack consistency in terms of producing for the markets due to insufficient access to production resources.

High transaction costs are caused, *inter alia*, by poor infrastructure and communication services in remote rural areas (Baloyi, 2010). Transaction costs also result from information inefficiencies and institutional problems such as the absence of formal markets (Makhura, 2001). Transaction costs include the costs of information, negotiation, monitoring, co-ordination, and enforcement of contracts. There is no doubt that high transaction costs tend to discourage commercialization. Small-scale farmers are located in remote areas and are geographically dispersed and far away from

lucrative markets. Distance to the market, together with poor infrastructure and poor access to assets and information results in high costs. Since small-scale farmers are poor, they find it difficult to compete in lucrative markets due to the high transaction costs. Minimizing transaction costs is the key to improving access to high-value markets in developing countries, because high transaction costs will make it difficult for poor small-scale enterprises to market their produce. For small-scale farmers to be integrated into the agricultural supply chain, greater effort is needed to reduce transaction costs and improve efficiencies along the agricultural value chain. (Baloyi, 2010)

Small-scale farmers do not have access to on-farm infrastructure such as store-rooms and cold-rooms to keep their products in good condition after harvest. Lack of access to facilities such as post-harvest, storage and processing facilities constitutes a barrier to entry into agricultural markets, since the emphasis of buyers is more on quality. Access to storage facilities increases farmers' flexibility in selling their products, as well as their bargaining power (Bienabe, E., Coronel C., Le Coq, J. & Liagre, L., 2004).

Rural producers, and especially small farmers, have little information about the market demand, which is costly to obtain. They may gather information through contact with other actors in the commodity chain, but the accuracy of this information is not certified, since those actors might be exhibiting "opportunistic behavior" (Bienabe, E., Coronel C., Le Coq, J. & Liagre, L., 2004). Small-scale farmers lack information about product prices at the local level, about quality requirements, about the best places and times to sell their products, and about potential buyers. This in turn reduces their ability to trade their products efficiently and to derive the full benefit from the marketable part of their production. (Baloyi, 2010)

Due to their low endowment in production factors, such as land, water and capital assets, the majority of small-scale farmers produce low quantities of products that are of poor quality, which leads to their products being neglected by output markets. Increasing concentration in the food value chain is a global trend, caused by increasingly demanding consumers and concerns about food safety, which tend to make it very difficult for small-scale farmers to enter high-value markets in light of the low quantity and poor quality of their products.

Most small-scale farmers are not consistent in terms of producing products and supplying them to fresh produce markets and agro-processing industries. Many emerging farmers can only deliver produce to fresh produce markets for two or three months of the year and cannot achieve continuity in the market (Baloyi, 2010). Supermarkets are also reluctant to buy from small-scale farmers for this reason. The reasons were well articulated by (Reardon, 2005) in his statement that "...supermarkets would rather not deal with small-scale farmers – they don't deliver (start/stop), don't invest (invest just one time and don't keep up), and are a major hassle to work with".

Most small-scale farmers have no means of transport to carry their produce to markets. Transportation problems result in loss of quality and late delivery, which in turn lead to lower prices, and this is regarded as the greatest problem faced by emerging farmers (Louw, A., Madevu, H., Jordaan, D. & Vermeulen, H., 2004).

Obviously, the rural decision-makers are negatively affected by lack of markets and imperfect information in remote areas. Most small-scale farmers are located in rural areas where there are no formal agricultural markets or agro - processing industries. They are compelled to market their produce to local communities in their areas, sometimes at lower prices, or to transport their products to towns at a higher cost (Baloyi, 2010).

The bargaining power of the small producers is especially low since they have poor access to market information and limited access to financial markets, which prevents them from selling their products at the most profitable time. Their lack of bargaining power may lead them to undervalue their production and obtain a smaller share of the added value created in the commodity chain. Small farmers have particularly low bargaining power when they operate in long supply chains, where the specificity of the product transformation assets leads to the creation of oligopsony (Bienabe, E., Coronel C., Le Coq, J. & Liagre, L., 2004).

Some small-scale farmers with the potential to export some of their products are confronted with international regulation standards that they find difficult to meet. Farmers are now faced with new challenges that include products of high quality, knowledge of Good Agricultural Practices (GAP), Sanitary and Phytosanitary (SPS) measures, capacity to comply with market and regulatory requirements, new issues of

conformity assessment, and traceability. This setup poses a major challenge for farm producers, especially small-scale farmers, in their efforts to position themselves as business-driven competitors in a less-controlled global trading environment (Baloyi, 2010).

Technological innovations have long been a major contributor to progress in agribusiness and will continue to influence the smooth running of business in the agricultural value chain. Rapid dissemination of information and communication can lead to high cost savings. E-commerce can be a good means of minimizing transaction costs in agribusiness by enabling the online buying and selling of products. In contrast to developed countries, small-scale farmers in developing countries are poor and have no access to information technology, with the majority being poorly linked to international trade due to technological barriers. Small-scale farmers' lack of access to technology has a negative effect on their ability to access markets locally, nationally, and globally (Baloyi, 2010).

2.7 Review on Previous Studies

Oxfam released their report, named “Unfair Harvest: The State of Rice in Asia”, in March 2019. The report presents that most of the rice in Asia is grown by small-scale producers in Asia. However, they have been trapped in unequal relations with traders, millers and other actors along with value chain, lacking the power to negotiate for a fair share of the value of what they have grown. Moreover, their risks and vulnerability are added increasing input costs, unsustainable production methods and climate change. The report also found that women who are working in the Asian rice sector receive low wages and suffer discrimination. The report spotted that farmers receive as little as four percent of the price paid by the consumers that leave them with incomes significantly below the level needed for a decent standard of living. The report also recognizes that changing with modernization of rice sector in Asia is fast and modernization is seen as a major opportunity for rice farmers. However, the report points out that small-scale producers and workers are being further squeezed by these changes. The report suggests to develop new and better regulated value chains that offers opportunities to small-scale farmers to escape exploitative relations, and move out of poverty. The report also calls on governments, the private sector and civil societies to address structural inequalities to ensure that modernization of rice sector benefits small-scale farmers. (Oxfam, 2019)

The World Bank issued the paper, named “Lao PDR: Rural and Agriculture Sector Issues Paper”, in May 2006 after they assessed agricultural sector growth and rural poverty reduction in Lao PDR during the past decade (World Bank, Lao PDR: Rural and Agriculture Sector Issues Paper (English), 2006). That paper emphasizes emerging strategy and policy aspects which merit attention as government of Lao PDR implements and monitors its programme. Assessment was done based on the secondary data like existing documents of government of Lao PDR, development organization and academic analysis. In addition to, the World Bank also used its own reports. The World Bank highlighted following points in the paper. Over the past decade, agriculture has grown 4.7 percent in average annually. Poverty in Lao PDR is primary level (World Bank, Lao PDR: Rural and Agriculture Sector Issues Paper (English), 2006). The links between agriculture and rural poverty are best understood based on disaggregated agricultural systems. Lowland and upland agriculture are likely to respond differently. Importance of agriculture to rural households is high because non-agricultural income opportunities remains limited. Improving agricultural productivity of rural producers and expanding their market orientation is constrained by their paucity of physical assets and human capital. Support for integration of markets, both domestic and external, can facilitate growth and help all Provinces participate in economic growth. The unfavorable business environment in rural areas leaves Laos with underdeveloped value chains beyond the farm level. More effective public expenditure is essential to improve services and investments that are core responsibilities of the public sector in supporting rural producers. The World Bank suggested the government of Lao PDR to improve productivity of farmers and linkage farmers to the markets, and to capture value added opportunities. Another advice is that public expenditure performance should be strengthened. (World Bank, Lao PDR: Rural and Agriculture Sector Issues Paper (English), 2006)

The World Bank published a report in February 2016, named “Myanmar: Analysis of Farm Production Economics”, in partnership with the Livelihoods and Food Security Multi-Donor Trust Fund – LIFT. The World Bank noticed that lack of reliable farm data is a significant constraint to designing effective programme in policies in Myanmar. They aim that this report will fill some data gaps. In additional to, presenting collected data, the report offers the first analysis of these data. However, the report confesses that it is not nationally representative and its results need to be interpreted in

that context. The report found four main points. First, Myanmar's farming systems are diversified more than commonly thought. While during the monsoon season most farms produce paddy, during the cool and dry seasons most farms produce crops other than paddy, mainly beans and pulses, oilseeds, and maize. Second finding is that the analysis reconfirmed that agricultural productivity in Myanmar is low, irrespective of what indicators are used, limiting the sector's contribution to poverty reduction and shared prosperity. Third, low productivity is a result of multiple factors, many of them associated with the undersupply of quality public services such as research, extension, and rural infrastructure, in delivery of which the government has a key role to play. Lastly, going forward and given that paddy is less profitable and more costly to produce than other crops in most agro-ecological zones, especially during the cool and dry seasons, it is desirable to redesign public programs from exclusive support of paddy production to support for broad-based agricultural development. (World Bank, Myanmar: Analysis of Farm Production Economics, 2016)

CHAPTER III

AGRICULTURAL SECTOR IN MYANMAR

3.1 Background

The Union of Myanmar is the largest country in South East Asia mainland which spans 676,578 square kilometers. It is located between 10° and 29° North latitude and 92° and 101° East longitude. It has international territories with China, The Lao People's Democratic Republic, Bangladesh, India and Thailand. The Bay of Bengal and the Andaman Sea form southern boundary which extends 2,832 kilometers from the south most part of the border of Thailand to the border of Bangladesh in the west. Because of its geographical location and strategic position, Myanmar is known to the world as “The Heartland of Asia”.

Myanmar is highly diverse in terms of its agro-ecological zones and farming systems. It has three main agro-ecological zones, namely the Delta, the Dry Zone and the hill areas where agro-climatic zones. The densely-populated Delta in the south is home to about 22 million people who are mainly engaged in lowland rice cultivation, particularly during the monsoon season. In contrast, central Myanmar, lying in the monsoon's rainfall shadow, is a dry region with population clusters along the main river valleys. Dry Zone farmers cultivate a range of rain-fed crops. About 19 million people live in the Dry Zone. The third largest agricultural zone is the hill region, dominated by Shan State in the east, and habited by 6.5 million people. Hill farmers cultivate a wide range of rain-fed crops and horticulture products along with rice, maize and pulses (Thanda Kyi, 2016).

Table 3. 1: Major agro-climatic zones in Myanmar

Name	Geographical description	Administrative unit	Main Agricultural practice
A. Bago, Kachin Riverside Land	Upper Delta, Kachin plain, flat plain along the Ayeyarwady and Sittaung, moderate rainfall (1000-2500 mm).	Ayeyarwady Region, Sagaing Region, Mandalay Region, Bago Region and Kachin State	Rice, pulses, oilseeds, sugarcane, tobacco and Kaing/Kyun cultivation.
B. Central Dry Zone	Flat plain, some uneven topography, less than 1000 mm rain.	Magway Region, Mandalay Region and Sagaing Region	Upland crops, oilseeds, pulses, rice, cotton, irrigated agriculture and Kaing/Kyun cultivation.
C. Delta and Coastal Lowland	Delta, lowland and mouth of rivers in coastal area, heavy rainfall (more than 2500 mm).	Ayeyarwady, Yangon and Bago Regions, Mon and Kayin States, Taninthayi Region and Rakhine State.	Rice, pulses, oilseeds and nipa palm.
D. Kachin and Coastal Upland	Mountainous, sloping land, heavy rainfall (more than 2 500 mm).	Kachin and Rakhine States, Taninthayi Region, Mon, Kayin and Kayah States, Yangon and Bago Regions.	Orchards, plantation crops and upland agriculture.
E. North, East and West Hills	Hilly, uneven topography, sloping land, moderate to heavy rainfall	Kachin, Chin and Shan States.	Upland crops, shifting cultivation and fruit trees.
F. Upper, Lower Myanmar and Shan Plain	Plains, plateau, upper and lower parts outside central Dry Zone.	Sagaing Region, Kachin and Shan States, Bago, Magway, Mandalay and Yangon Regions.	Upland crops, oilseeds, pulses, vegetable and wheat.

Source: FAO/WFP crop and food security assessment mission to Myanmar

Three different seasons enable the farmers to cultivate crops at different times of the year. The main farming season for the most of the country is the hot monsoon period from May to October. The ensuing dry period includes the cool, dry winter months from October to February, followed by the dry and hot summer season from February to April. The structure of crop, livestock and fish production varies considerably during Myanmar's three seasons as well as across its three principles agro-ecological zones. Myanmar's broad range of elevation, latitude, temperature and rainfall is marked by wide climate diversity. The maximum daily temperature ranges from an average of 32 degrees Celsius in the Delta to 21 degrees Celsius in the hill region. The average rainfall ranges from 5000 mm along the coast to 2,500 mm in the Delta and about 600 mm in the Dry Zone. This diversity gives rise to an enormous variety of microclimates. Although agriculture is the main source of livelihood for the majority of people living largely in the countryside, over a third of the rural population is below the poverty line. About 30% of all rural people are landless and have to work as farm labourers for a living (Thanda Kyi, 2016).

3.2 Myanmar Agricultural Policy Changes

Major issues for developing countries are feeding its people, domestic prices stability and self-sufficiency in most staple crops. In Asia, self-sufficiency in rice has been considered crucial for both economic and social reasons as well as political reason. Policies must be tailored to dovetail with specific conditions and needs within the sector or group of people. As rice has historically been a centerpiece of agricultural policies in Myanmar, agricultural policy changes have reflected rice policy changes. When Myanmar Kings were ruling the nation, Kings controlled the trade and prohibited rice export. These restrictions discourage the farmers from producing the rice than needed for their own utilization and tax payments. Agricultural policies which was newly developed based on rice crop under British Colonial Administration and it changed from subsistence farming to commercial farming. Paddy farmer were given the rights to owns the land and land holding rights as well as farmers could make choose the crop to cultivate. Rice market was monopolized by British and European companies.

After Myanmar has gained its independence from British in 1948, the democratic government continued most of the policies and practices of British Colonial Administration. During the Socialist regime, the government initiated centrally planned

economic system in 1962. They also changed the economic system from export-oriented system to inward-looking system. All the land was nationalized and granted the tilling rights to the farmers as a tenant. Crops to cultivate were decided by the government based on their plan. They focus much on rice production rather than increasing income of the farmers. Domestic rice trade was banned and rice export was monopolized by the state. The government generate its revenue by purchasing the rice from the farmer with price compression and export them with international market price. After 1988, the State Law and Order Restoration Council, SLORC, lifted banning domestic rice trade but rice export was being monopolized by the State. Since 1988, the SLORC encouraged private sector participation in beans and pulsed trade in domestic market. However, some crops like rice were still restricted to be exported. In 1992, the SLORC introduce summer paddy programme. Most of the rice policies were continuously practiced until 2003 as they were in Socialist era. The government kept purchasing paddy via Myanmar Agricultural Product Trading, MAPT. The State Peace and Development Council, SPDC abolished the paddy procurement programme in 2003 and industrial crops in 2004. They also encouraged private sector to participate in international rice trading. However, due to the government's national food security policy, the SPDC practiced the rice export quota system and levied 10 percent tax on export until the late of 2000s.

The first democratic government after 1988 came up through the election in 2010. They liberalized the rice sector gradually since 2011. The Farm Land Law was activated in 2012 and according to this law, all the lands are owned by the State but farmers were given the holding rights. They can sell or mortgage their farm-lands and they can also sell freely their products to any buyers at the market price. They also passaged other agriculture related regulatory laws, Seeds Law in 2012 and Vacant, Fallow and Virgin Land Law in 2012. Starting from the 1st April 2015, democratic people government came to the power. The NLD government released its 12 points of economics policy on 29th July 2016. In May 2018, Myanmar Agricultural Development Bank, MADB, started issuing individual monsoon loans rather than group loan.

3.3 Share of Agricultural Sector in GDP

GDP is the sum of the market values, or prices, of all final goods and services produced in an economy during a period of time. It is composed by three main sectors, agricultural sector, industrial sector and services sector. Agricultural sector includes forestry, hunting and fishing, as well as the cultivation of crops and livestock production. This study relied on Myanmar Statistical Yearbook (2018) to examine GDP share of agricultural sector in Myanmar.

Table 3. 2: Gross Domestic Product at constant price by sector of activity (absolute values in billions of kyat)

Sectors	(At 2010 – 2011 constant prices)					
	2010-2011	2013-2014	2014-2015	2015-2016	2016-2017 (P.A)	2017-2018 (March)
AGRICULTURE	14658.96	15346.11	15768.77	16306.18	16230.93	16439.26
- Agriculture	11108.40	10959.27	11113.01	11357.41	11261.66	11272.92
- Livestock and Fishery	3392.10	4217.59	4529.33	4820.33	4917.64	5099.50
- Forestry	158.45	169.25	126.43	128.43	51.63	66.83
INDUSTRY	10528.14	13963.08	15659.18	16962.76	18476.75	20216.36
- Energy	66.99	65.28	88.82	88.37	82.08	92.64
- Mining	299.43	407.17	610.52	512.23	572.05	643.87
- Processing and Manufacturing	7900.49	10387.88	11370.55	12496.23	13659.25	15060.28
- Electric Power	421.88	551.84	633.35	716.28	773.46	822.01
- Construction	1839.33	2550.90	2955.95	3149.65	3389.92	3597.56
SERVICES	14589.66	19569.98	21357.10	23207.29	25079.44	27172.30
- Transportation	4594.36	6241.48	6609.98	7133.37	7665.08	8261.58
- Communications	332.23	1546.39	2185.66	2639.38	2938.97	3274.37
- Financial Institutions	37.72	147.61	180.26	223.78	309.47	384.44
- Social and Administrative Services	915.72	1271.00	1421.44	1506.57	1573.63	1637.90
- Rental and Other Services	738.48	1145.56	1269.46	1417.94	1590.43	1787.27
- Trade	7971.16	9217.93	9690.30	10286.25	11001.87	11826.74
GROSS DOMESTIC PRODUCT	39776.76	48879.16	52785.05	56476.23	59787.13	63827.92
AGRICULTURE PARTICIPATION IN GDP (%)	36.85	31.40	29.87	28.87	27.15	25.76

Source: Myanmar Statistical Yearbook (2018)

Contribution of agricultural sector to the GDP has been declined gradually year by year. Moreover, the contribution of agriculture alone (excluding forestry, livestock and fishery) has been declined year after year since the financial year 2010 – 2011. Its contribution in the financial year 2015 – 2016 was the lowest year since the financial year 2010 – 2011 with 20 percent. GDP growth rate of the financial year 2015 – 2016 was declined from where it was in the financial year 2010 – 2011, from 9.6 percent in 2010 – 2011 to 7.0 percent in 2015 – 2016. Moreover, growth of agriculture alone has also been shrunk, from 4.0 percent in the financial year 2010 – 2011 to 2.2 percent in the financial year 2015 – 2016.

3.4 Agricultural Sector in the Government Expenditure

Public spending to agricultural sector is critical both for economic development and poverty alleviation. It is very true for developing countries as most of their people live in rural area and depend on agricultural sector for their livelihoods. The following table presents public expenditure of Myanmar and occupation of agricultural sector in it.

Table 3. 3: Expenditure for Agricultural Sector in Union Government Budget (absolute values in kyat millions)

Financial years	Total expenditure	Expenditure for Agricultural Sector	Percentage
2005 – 2006	2353.41	122.75	5.22
2010 - 2011	7505.72	282.05	3.76
2013 - 2014	14280.21	546.00	3.82
2014 - 2015	21291.55	541.61	2.54
2015 - 2016	18923.65	615.51	3.25
2016 – 2017(P.A)	18367.93	514.97	2.80

Source: Myanmar Statistical Yearbook (2018)

The Union Government expenditure has been increased year after year. Agricultural sector had been peaked by over the six hundred million kyats in the

financial year 2015 – 2016. It is almost three times of the budget for the financial year 2010 – 2011. In each financial year since 2010 – 2011, agricultural sector took under the four percent of total expenditure in the respective financial year. Its volume in the expenditure for the financial year 2016 – 2017 was almost double than that it was in the financial year 2010 – 2011. However, its portion in the government expenditure for the financial year 2016 – 2017 was less than what it was in the financial year 2010 – 2011.

3.5 Land Utilization

Myanmar possesses a large land area in South East Asia region and it is unlike most of its neighboring countries. Generally, the country can be divided into four regions: Delta, Dry Zone, Coastal and Mountainous regions.

Table 3. 4: Area classified by type of land (*absolute value in thousand acres*)

Year	Reserved Forests	Current Fallows	Net Area Sown	Occupied Area	Cultivable Waste – Fallows excluded	Other Wood Land	Others	Total Area
2005-2006	38,813	910	26,989	27,899	15,516	44,055	40,903	167,186
2010-2011	44,271	569	29,703	30,272	13,333	38,621	40,689	167,186
2013-2014	45,950	1,129	29,328	30,457	13,058	36,675	41,046	167,186
2014-2015	45,896	1,094	29,617	30,711	13,014	36,409	41,156	167,186
2015-2016	45,848	1,111	29,671	30,782	12,964	36,427	41,165	167,186
2016-2017	46,100	1,165	29,746	30,911	12,946	36,107	41,122	167,186
2017-2018	46,649	1,149	29,792	30,941	13,695	35,853	40,048	167,186

Source: Myanmar Statistical Yearbook (2018)

Total net area sown in financial year 2017 – 2018 occupies 18 percent of total area. It has been gradually increased since the financial year 2015 – 2016 where it was 16 percent of total area. If it is compared between these two financial years, it was increased 10 percent.

Table 3. 5: Land utilization of net area sown (absolute values in thousand acres)

Year	Paddy	Ya	Kaing	Garden	Dhani	Taungya	Net Area Sown
2005 - 2006	15,329	9,063	1,347	2,814	116	830	29,499
2010 - 2011	15,997	10,476	1,403	4,944	123	1,028	33,971
2013 - 2014	15,548	10,177	1,351	4,857	121	714	32,768
2014 - 2015	15,629	10,227	1,350	5,009	121	678	33,014
2015 - 2016	15,658	10,242	1,343	4,995	121	657	33,016
2016 - 2017	15,625	10,305	1,355	5,039	117	608	33,049
2017 - 2018	15,673	10,331	1,365	5,063	117	548	33,097

Source: Myanmar Statistical Yearbook (2018)

Paddy land and Ya land occupied majority of new area sown in each year. They took almost 80 percent of net area sown in the financial year 2017 – 2018. Generally, area of paddy land Ya land have increased gradually since the financial year 2013 – 2014.

3.6 Paddy Cultivation

Paddy is historically dominant crop among the major cereals crops in Myanmar. It is also the most crucial agricultural commodity. It is cultivated across the country.

Table 3. 6: Sown acreage, harvested acreage and production of cereal crops (absolute values in thousand)

Year	Classification	Unit	Paddy	Wheat	Maize
2012-2013	Sown	Acre	17,893	245	1,042
	Harvested	Acre	17,269	245	1,035
	Production	Ton	26,216	177	1,501
2013-2014	Sown	Acre	17,998	249	1,088
	Harvested	Acre	17,181	249	1,087
	Production	Ton	26,372	182	1,600
2014-2015	Sown	Acre	17,722	243	1,134
	Harvested	Acre	16,974	243	1,132
	Production	Ton	26,423	182	1,693
2015-2016	Sown	Acre	17,820	237	1,166
	Harvested	Acre	16,727	237	1,160
	Production	Ton	26,210	179	1,748
2016-2017	Sown	Acre	17,695	213	1,211
	Harvested	Acre	16,615	213	1,206
	Production	Ton	25,672	160	1,830
2017-2018	Sown	Acre	17,930	161	1,246
	Harvested	Acre	16,668	161	1,237
	Production	Ton	25,624	123	1,909

Source: Myanmar Statistical Yearbook (2018)

It took around 93 percent of total sown area for major cereals crops in very year since the financial year 2012 – 2013. Flood is being affect to the paddy cultivation in Myanmar. Net area sown for paddy in the financial year 2017 – 2018 was increased in 0.21 percent from what it was in the financial year 2012 – 2013. Although sown acreage was increased, harvested acreage against sown area was declined in 3.48 percent. 93 percent of sown area was cultivated in the financial year 2017 – 2018 but it was 97 percent in the financial year 2012 – 2013. Yield per harvested acre for paddy in the financial year 2017 – 2018 was 75 baskets. It was increased from 71 baskets in the financial year 2005 – 2006. Yield per acre was not increased significantly since the financial year 2013 – 2014. It was 76 baskets in the financial year 2014 – 2015 and 2015 – 2016 but it was declined to 75 baskets in the financial year 2016 – 2017 and 2017 – 2018.

3.7 Inputs

Agricultural inputs are external sources put into the soil that helps a farmer’s upcoming yield. It can be placed in three main sectors: seed, fertilizer and crop protection.

Table 3. 7: Utilization of fertilizer (absolute values in metric ton)

Year	Urea	T-Super	Potash	Compound	Other	Total
2005 - 2006	5,912	2,092	1,302	2,456	-	11,762
2010 - 2011	4,588	171	182	766	-	5,707
2013 - 2014	22,597	11,900	5,449	29,935	5,087	74,968
2014 - 2015	10,431	5,208	2,492	8,304	2,007	28,442
2015 - 2016	1,114,596	165,245	58,297	1,033,221	56,114	2,427,473
2016 - 2017	1,321,267	201,990	62,864	1,493,423	87,798	3,167,342
2017 - 2018	1,546,037	270,841	141,283	1,394,478	131,158	3,483,797

Source: Myanmar Statistical Yearbook (2018)

Urea, T-Super, Potash and Compound fertilizers are mainly used by the farmers in Myanmar. Urea fertilizer is the most widely used and it took the highest portion fertilizer utilization in almost all the years since the financial year 2005 – 2006. It is followed by the compound fertilizer. Utilization of fertilizer has been increased year by

year. Utilization of fertilization in the financial year 2017 – 2018 is almost three hundred times than it was in the financial year 2005 – 2006.

Table 3. 8: Distribution of quality seeds for cereal crops (absolute values)

Particulars	Unit	2005-2006	2010-2011	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Paddy	Thousand Basket	-	277	104	955	1,065	914	110
Wheat	Basket	-	284	-	-	-	-	-
Maize	Thousand Basket	-	3	1	2	3	1	2
Sorghum	Basket	-	146	64	-	420	-	-

Source: Myanmar Statistical Yearbook (2018)

Distribution of quality seeds for paddy was volatile in different years. There was not record for the financial year 2005 – 2006. Since, the financial year 2013 – 2014, it was at its best position in the financial year 2015 – 2016 and 1,065 thousand basket of good quality paddy seeds were distributed. However, the financial 2013 – 2014 was the least performed years and the financial year 2017 – 2018 was at the second lowest position in the record in the last five years.

Table 3. 9: Pesticides used for paddy plant protection (absolute values)

Crop	Unit	2010-2011	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
TOTAL	Thousand pounds	54	2,338	5,947	17,616	25,106	1,517
	Thousand gallons	1,283	1,163	1,114	3,161	5,815	12,663
Paddy	Thousand pounds	1,362	1,126	3,063	4,026	4,602	142
	Thousand gallons	596	133	293	451	655	1,185

Source: Myanmar Statistical Yearbook (2018)

In general, pesticide usage for paddy plan protection has been increased. In the financial year 2017 – 2018, pesticide in solid/powder form was dropped in over 32 times than it was in the financial year 2016 – 2017. On the other hand, pesticide in liquid form was sharply, almost in double, increased than it was in the financial year 2016 – 2017.

3.8 Agricultural Loans

Government of Myanmar provide financial assistance its farmers via agricultural loan which can be used to meet the cost of farming and cultivating.

Table 3. 10: Agricultural loans by crop (absolute values in Kyat millions)

Crop	2010-2011	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
GRAND TOTAL	190,680	1,158,729	1,167,485	1,091,405	1,630,624	1,707,709
CEREALS	157,537	1,039,153	1,051,028	994,051	1,536,398	1,461,372
- Paddy	156,495	1,035,841	1,047,682	993,010	1,535,351	1,457,546
- Wheat	-	-	-	-	-	-
- Maize	1,042	3,312	3,346	1,041	1,047	3,826
OILSEEDS	17,509	43,220	42,345	36,777	36,738	95,042
CONDIMENTS	-	-	-	-	-	-
TOBACCO	-	-	-	-	-	-
FIBRES	1,405	2,348	1,781	1,440	1,397	3,196
OTHERS	14,229	74,008	72,331	59,136	56,091	148,099

Source: Myanmar Statistical Yearbook (2018)

Agricultural loans issued has been increased year after year since the financial year 2010 – 2011. The volume issued in the financial year 2017 – 2018 was almost nine times than it has been in the financial year 2010 – 2011. Most of the portion of agricultural loans has gone to paddy cultivation and it took 82 – 92 percent of total amount during the financial year 2010 – 2011 to 2017 – 2018. Although total volume of loan issued has increased, the volume of loan for paddy cultivation was slightly decreased than it was in the financial year 2016 – 2017. However, it is still the second most volume of loan issued since the financial year 2010 – 2011. On the other, Myanmar Agricultural Development Bank, primary source of agricultural loan for the farmers in Myanmar, has USD 1.98 trillion, equivalent to MMK 3,020.71 trillion

outstanding loans, mostly to small-scale farmers (EuroCham Myanmar, 2018). In the financial year 2018 – 2019, MADB plan to lend over MMK 2 trillion to the farmers (Zeya Nyein, 2018). Starting from 2018, it has disbursed loans on an individual basis and abolished the group-based lending system (Daw Khin Nan Myint, Deputy General Manager, MADB, 2018).

Table 3. 11: Agricultural loans by States and Regions (absolute values in Kyat millions)

States and Regions	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	Grand Total
Ayeyarwady	334,706	343,589	322,658	489,580	447,991	1,938,523
Bago	259,522	250,712	235,081	350,265	359,785	1,455,365
Chin	4,561	6,275	5,527	9,080	1,151	26,594
Kachin	17,301	19,404	21,537	32,331	35,675	126,249
Kayah	1,652	1,886	2,046	3,038	3,526	12,149
Kayin	1,106	1,208	1,201	1,836	8,137	13,489
Magway	49,904	52,859	56,069	77,199	107,960	343,991
Mandala	82,604	80,463	73,792	104,713	133,180	474,752
Mon	31,980	32,413	31,721	48,535	48,197	192,846
Nay Pyi Taw	15,304	14,424	14,227	20,481	20,781	85,217
Rakhine	48,033	50,758	49,790	82,006	88,615	319,201
Sagaing	160,122	161,387	153,038	222,889	256,925	954,360
Shan	21,959	23,602	13,553	22,482	25,094	106,691
Taninthayi	11,446	12,241	11,911	18,082	17,325	71,005
Yangon	118,527	116,265	99,252	148,106	153,368	635,519
UNION TOTAL	1,158,729	1,167,485	1,091,405	1,630,624	1,707,709	6,755,952

Source: Myanmar Statistical Yearbook (2018)

During the financial years 2013 – 2014 to 2017 – 2018, major portion of seasonality loan occupied by Ayeyarwady Region with 28.83 percent in average whilst the least portion went to Kayin State with 0.18 percent in average of total disbursed volume.

3.9 Agricultural Equipment

Machineries, equipment and implements are applied in day to day farm activities in order to increase marginal outputs in agricultural production.

Table 3. 12: Agricultural equipment (absolute values in thousand numbers)

Description	2010- 2011	2013- 2014	2014- 2015	2015- 2016	2016- 2017	2017- 2018
IMPLEMENTS	10,962	11,063	11,108	11,131	11,095	11,145
- Ploughs	3,085	3,077	3,078	3,081	3,059	3,043
- Harrows	3,182	3,196	3,211	3,217	3,200	3,245
- Mamooties and Spades	4,695	4,790	4,819	4,833	4,836	4,857
MACHINERIES	967	1,002	1,022	1,029	1,041	1,062
- Seed Drills (Harrow)	94	97	98	98	98	98
- Seed Drills (Plough)	23	23	23	23	23	26
- Rotary Harrows	632	626	622	622	603	602
- Water Pumps	207	242	262	267	290	305
- Tractors	11	14	17	19	27	31
VEHICLES	1,769	1,769	1,763	1,758	1,742	1,732
- Carts	1,769	1,769	1,763	1,758	1,742	1,732

Source: Myanmar Statistical Yearbook (2018)

Number of agricultural implements and machinery has been increased gradually since the financial year 2010 – 2011. In which number of tractors has been increased significantly, 11,000 in the financial year 2010 – 2011 and 31,000 in the financial year

2017 – 2018. However, total number of agricultural vehicles has been declined slightly since the financial year 2013 – 2014.

Table 3. 13: Distribution of wheel tractors by station (absolute values in number)

States and Regions	ATS*	2005	2010	2013	2014	2015	2016	2017
		2006	2011	2014	2015	2016	2017	2018
Ayeyarwady	18	355	249	243	291	348	334	313
Bago	21	631	372	336	387	428	582	520
Chin	-	-	-	-	-	-	-	2
Kachin	9	101	134	113	78	107	111	119
Kayah	1	53	37	37	53	45	43	40
Kayin	2	36	21	25	32	40	43	28
Magway	8	279	120	110	151	167	142	101
Mandalay	17	442	333	229	246	261	299	256
Mon	4	143	68	57	82	99	92	66
Nay Pyi Taw	3	85	78	59	117	134	97	104
Rakhine	3	73	58	56	80	89	87	61
Sagaing	16	334	245	180	228	231	231	229
Shan	8	202	164	179	202	200	197	179
Taninthayi	2	37	17	17	22	27	27	23
Yangon	5	113	128	141	152	135	131	109
Union Total	117	2,884	2,024	1,782	2,121	2,311	2,416	2,150

Source: Myanmar Statistical Yearbook (2018)

* ATS = Agricultural Tractors Station,

There were 2,150,000 of wheel tractors have been distributed to 177 of ATS, Agricultural Tractors Stations, across the country in the financial year 2017 – 2018. In which 12 percent ATS are located in Bago region and about quarter of wheel tractors have been distributed to those stations. ATS are concentrated in Delta and Dry Zone agroecological areas, especially Bago, Ayeyarwady, Mandalay and Sagaing regions.

Table 3. 14: Distribution of tractors by stations in Mandalay Region (absolute values in number)

Location of Agricultural Tractor Stations	Wheel Tractor						
	2005-2006	2010-2011	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Amarapura	25	16	10	16	14	13	10
Kyaukpadaung	21	14	9	11	8	10	10
Kyaukse	20	18	10	16	16	17	16
Madaya	20	16	11	9	14	23	36
Mahlaing	20	19	8	16	16	13	12
Meikhtila	25	20	12	9	16	16	16
Myingyan	30	20	13	23	22	19	10
Myittha	79	61	61	51	31	50	34
Nahtogyi	20	17	10	6	7	12	10
Nyaung-Oo	25	16	11	13	9	8	6
Patheingyi	32	20	12	9	14	18	10
Pyawbwe	20	14	8	13	17	16	16
Sintgaing	20	16	10	8	18	18	10
Tada-Oo	20	12	7	7	11	12	11
Thazi	20	16	11	11	10	13	13
Wundwin	25	18	18	15	20	23	18
Yamethin	20	20	8	13	18	18	18
Total	442	333	229	246	261	299	256

Source: Myanmar Statistical Yearbook (2018)

Mandalay region has 17 ATSs and 256,000 wheel-tractors have been distributed to those stations in the region. However, there is no ATS in study area of this thesis, Taungtha township. The nearest ATS for targeted villages are located in Myingyan and Nyaung-Oo townships. Even in those stations, number of distributed tractors have been declined since the financial year 2005 – 2006.

3.10 Contribution of Agricultural Sector in Export Earnings

The agricultural sector is one of the most important sectors for Myanmar economy. It has contributed significant amount to total export earnings.

Table 3. 15: Export by type of principle commodities (absolute values in US. \$ Million, quantity in thousand)

Commodity	Unit	2005-2006	2010-2011	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018 (p)
TOTAL EXPORTS	US. \$	3558	8861	11204	12524	11137	11952	14851
Agri. products	US. \$	435	1228	1058	1240	1224	1414	1324
- Rice and rice products	US. \$	37	198	134	151	102	202	504
	M.T.	180	536	391	461	319	691	1722
- Pulses	US. \$	322	800	743	951	990	1046	627
	M.T.	865	829	1132	1242	1020	1033	1002
- Maize	US. \$	11	11	**	2	**	14	9
	M.T.	90	45	1	5	1	76	48
- Oilcakes	US. \$	-	**	**	1	**	**	**
	M.T.	-	*	*	*	*	*	*
- Raw rubber	US. \$	35	154	72	38	31	56	65
	M.T.	29	47	31	28	31	42	45
- Raw cotton	US. \$	-	3	**	**	-	-	-
	M.T.	-	2	*	*	-	-	-
- Raw jute	US. \$	-	-	-	-	-	-	-
	M.T.	-	-	-	-	-	-	-
- Other Agricultural Products	US. \$	30	62	109	97	101	96	119

Source: Myanmar Statistical Yearbook (2018)

Notes. * Less than one unit

** Less than 0.005 US. \$ Million

Earning from exported commodities has been increased gradually during the financial year 2005 – 2006 to the financial year 2014 – 2015. It has dropped in the financial year 2015 – 2016 but it was recovered in the financial year 2016 – 2017. Export earnings from the agricultural products represent around nine to 12 percent of total export earnings. In which earning from the rice and rice products represents eight to 16 percent. The financial year 2016 – 2017 was the best performance year for

exporting rice and rice products. Around 691,000 metric ton of rice and rice products was exported in that year and USD 202 million was earned from that export.

Table 3. 16: Direction of rice export trade (absolute values in US \$ million, quantity in thousand)

Country of Destination	Unit	2005-2006	2010-2011	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018 (p)
TOTAL	US. \$	36.57	198.08	134.00	150.80	102.09	202.06	514.01
	M.T.	180	536	391	461	319	691	1722
South East Asia	US. \$	9.87	6.27	47.25	31.75	17.15	15.87	31.29
	M.T.	49	17	140	97	53	54	111
Rest of Asia	US. \$	6.11	63.29	45.53	26.25	17.75	38.82	134.00
	M.T.	31	175	131	79	55	124	418
Middle East	US. \$	18.50	0.45	2.58	10.79	1.79	6.13	0.51
	M.T.	90	1	8	33	5	21	2
America	US. \$	-	-	3.69	6.54	0.73	2.17	2.71
	M.T.	-	-	11	20	2	6	9
Europe	US. \$	0.24	41.25	34.30	72.97	63.12	85.58	132.63
	M.T.	1	107	99	224	199	293	457
Africa	US. \$	1.85	86.82	0.63	0.95	1.53	52.88	212.70
	M.T.	9	236	2	3	5	191	725
Oceania	US. \$	-	-	0.20	1.55	0.02	0.61	0.17
	M.T.	-	-	*	5	*	2	*

Source: Myanmar Statistical Yearbook (2018)

Notes. * Less than one unit

** Less than 0.005 US. \$ Million

Major markets of Myanmar rice and rice products is Europe. In the financial year 2016 – 2017, 42 percent of exported rice and rice products was gone to Europe market. It is followed by Africa market and markets in the other Asia countries (excluding ASEAN countries) with 28 percent and 18 percent respectively (CSO, Myanmar Statistical Yearbook 2018, 2018).

3.11 Characteristic of Dry Zone

Dry Zone lies on the central of the country astride the Ayeyarwady river. It is located between latitudes 19° 20' to 22° 50' North and longitudes 93° 40' to 96° 30' East (Tun Tun, 2000).It is encompassing 58 townships which span from lower Sagaing

region, to the western and central parts of Mandalay region and most of Magway region (MIMU, 2019). It covers total area of 33,680 square miles which is about 13 percent of the country (Tun Tun, 2000). Dry Zone is surrounded by Rakhine Range in the west, Bago Range in the south and Shan Plateau and Eastern Range in the east. Extension of these ranges form isolated low-laying ranges and hillocks in almost all of the townships, with elevation varying between 500 – 1800 feet (Tun Tun, 2000). The main rivers that cross the area are the Ayeyarwady, the Chindwin, the Mu, the Zawgyi and the Myitnge. The major creeks, named the Yaw, the Yama, the Mone, the Saline and the Mann, also travers the area. Most of the land is flat and undulating, making it suitable for extensive agriculture (Tun Tun, 2000). Rain usually occurs in late May to early June. Range of precipitation between 20 inches to 40 inches annually and average is 28.44 inches (Tun Tun, 2000). It is also draught prone area in Myanmar. Volume and frequency of yearly and seasonal rainfall are irregular making agriculture most unpredictable. March and April are the hottest months and temperature is above 43°C (Tun Tun, 2000). January is the coldest month and temperature is around 7°C. The average temperature is around 32°C (Tun Tun, 2000).

3.12 Socio-Economic and Agricultural Statistic of Mandalay Region

Mandalay region is not only located at the center of the country but also it is in the middle of the Dry Zone. It is located between latitudes 19° 30' to 23° 45' North and longitudes 94° 50' to 96° 50' East (CSO, Social-Economic Indicators of States and Regions (Myanmar), 2017). Its neighbours are Shan State at the East, Nay Pyi Taw Union Territory at the South, Sagaing Region at the West and North-West and Magwe Region at the South-West. It covers the area of 11,925.95 square miles (CSO, Social-Economic Indicators of States and Regions (Myanmar), 2017). The region consists of seven districts, which are subdivided into 28 townships. Its major businesses are agriculture, livestock, fishery, industry and tourism. There are over 6.17 million people are living in the Mandalay region and, in 2014, 200 people are living in a square kilometer (CSO, Myanmar Statistical Yearbook 2018, 2018). GDP of the Mandalay region was increased by 10.1 percent in the financial year 2015 – 2016 (CSO, Social-Economic Indicators of States and Regions (Myanmar), 2017). GDP per capita was 1,202,999 kyats in the financial year 2015 – 2016 (CSO, Social-Economic Indicators of States and Regions (Myanmar), 2017).

In the financial year 2016 – 2017, there are 17 weirs, which cover 109,932 acres of farmland and 88 tanks (lakes), which cover 590,954 acres of farmland (CSO, Myanmar Agricultural Statistics (2007-2008 to 2016-2017), 2018). The region possesses 23.52 percent of total irrigable area across the country in the financial year 2016 – 2017. In the same financial year, net area sown was 3,349,000 acres and in which 16 percent, equivalent to 534,000 acres, were irrigated area (CSO, Myanmar Agricultural Statistics (2007-2008 to 2016-2017), 2018). 460,915 acres of paddy was cultivated in the irrigated area during the financial year 2016 – 2017 (CSO, Myanmar Agricultural Statistics (2007-2008 to 2016-2017), 2018). There are 17 ATs, Agriculture Tractor Station, in the Mandalay region and 299 tractors were assigned to those stations in the financial year 2016 – 2017 (CSO, Myanmar Agricultural Statistics (2007-2008 to 2016-2017), 2018). Total volume of agricultural loan (seasonal) in the financial year 2017 – 2018 was increased and 133.18 trillion kyats was issued as agricultural loan to the farmers in the region (CSO, Myanmar Statistical Yearbook 2018, 2018). In the financial year 2016 – 2017, 739,531 acres were sowed for paddy cultivation, of which, 76.45 percent (equivalent to 565,339 acres) were harvested and 933,373 metric tons of paddy were produced (CSO, Myanmar Statistical Yearbook 2018, 2018).

CHAPTER IV

SURVEY STRATEGIES

4.1 Survey Profile

Taungtha is one of the townships in Myingyan District, Mandalay Region. It is located in middle-west of Mandalay Region. It is located between 21° 00' 20" (North) and 21° 24' 00" (North), and 95° 06' 05" (East) and 95° 08' 05" (East). Its total area is 507.21 square feet. It is neighbored by Myingyan township in North, Natogyi township in North-East, Mahlaing township in East, Kyaukpadaung township in South, Nyaung-Oo township in West and Ngathayauk sub-township in North-West (Township General Administration Department, 2017). Altitude of Taungtha is at 442.9 feet above the sea level. Half of the township area is uneven valley which is full of catchment hills, ranges, fangs, mountains, hills and creeks. The rest is uneven plain. Sintaewa creek lays in the township for 18 miles and flows into Ayeyarwady river which crosses the township for nine miles.

Table 4. 1: Temperature record of Taungtha township

Sr. No.	Years	Temperature (°C)	
		Highest record at summer	Lowest record in Winter
1	2011	38.32	10.42
2	2012	40.80	13.00
3	2013	41.30	10.40
4	2014	41.10	13.20
5	2015	40.10	11.40
6	2016	45.00	9.00
7	2017	45.00	9.00

Source: Township General Administration Department, Taungtha

Taungtha is located in Dry Zone and its average temperature is between 19.85°C and 41.82 °C. Its average rain fall is around 24.42 inches per year (Township General Administration Department, 2017).

Table 4. 2: Rain fall record of Taungtha township

Sr. No.	Years	Total rain fall	
		# of days	Inches
1	2015	48	15.66
2	2016	55	34.44
3	2017	53	36.73
4	2018	39	20.15
5	2019 (as of July)	14	7.68

Source: Township Department of Agriculture, Taungtha

According to the rain fall record from Township Department of Agriculture, 2015 was notably dry and total rain fall in that year was only 15.66 inches. 2018 followed by with 20.15 inches as second most dry year since 2015. Draught is one of the characteristics of the Dry Zone and it is quite challenge for paddy cultivation. Irregular rain fall pattern and low rain fall can cause uncertainties to the farmers, especially for paddy specialized small-scale farmers. According to the 2014 Myanmar Population and Housing Census, total population of Taungtha township is 216,642. There are more females than males with 81 males per 100 females. Almost of those people live in rural area while only 8.1 percent of total population live in urban areas. Its population density is 165 persons per square kilometer. The proportion of productive working population between 15 and 64 years in Taungtha township is 63.8 per cent while children aged 14 and below is 28.3 per cent and the elderly aged 65 and over is 7.9 per cent respectively. According to the 2014 Myanmar Population and Housing Census, labour participation rate for the population aged between 15 and 64 years in Taungtha township is 63.3 per cent. Female participation in labour force 47.9 per cent and is much lower than that of their counterparts which is 83.7 per cent. Agricultural sector is major sector which can create job opportunities in Taungtha township and it employed 47 per cent of labour force. (Department of Population, Report of the 2014 Union of Myanmar Population and Housing Census, 2014)

Taungtha is located in central Myanmar which is also known as Dry Zone area. Its major economic activities are agriculture, livestock and services. It can access to upper and lower parts of Myanmar via both land routes and water ways. Its main products are pulses, beans, oil crops, jaggery, onion and maze. Most of the products are exported to lower parts of Myanmar. Its major imported items are rice and fishery products and which are imported from lower parts of Myanmar. (Township General Administration Department, 2017)

According to the records of (Township General Administration Department, 2017), type of agricultural assets in the township can be divided in to government-own assets and private-own assets. Farmers own 170 tractors, 25 hand-tractors, 27 threshers and 3060 water pumps while only 15 water pumps are recorded as government-own assets. Both of them don't possess seeders, harvesters and combine harvesters. There were 100,969 bulls and 3,345 buffalos for agricultural application in 2017 (Township General Administration Department, 2017). According to the records of Township General Administration Department in Taungtha, there were 19,827 plows and 31,576 furrows that were using in 2017 (Township General Administration Department, 2017).

Table 4. 3: Self-sufficiency ratio for rice cultivation in Taungtha township

Description	Financial years					
	2013 – 2014	2014 – 2015	2015 – 2016	2016 – 2017	2017 – 2018	2018 - 2019
Self-sufficiency ratio for rice cultivation (%)	12.84	14.03	12.51	11.32	12.26	11.76

Source: Township Department of Agriculture, Taungtha

Taungtha cannot produce paddy enough for its people consumption. Its rice self-sufficiency ratio is under 15 percent. Since financial year 2013 – 2014, the ratio was the highest in financial year 2014 – 2015 with 14.03 percent. Since then it has been gradually declined. The ratio in recent financial year (2018 – 2019) was 11.76 percent and which is the second lowest record in the last six years. This study notices that rice self-sufficiency ratio is directly related to paddy cultivated area in that specific year.

Table 4. 4: Land utilization by type (2017)

Sr. No.	Type of land	Area (acre)
1	Farm land	204,794
2	Land undone	26,685
3	Graze land	311
4	Industrial land	856
5	Urban area	785
6	Village land	8,225
7	Other land	23,714
8	Forest land	17,918
9	Virgin land	6,164
10	Non-cultivable land	35,161
	Total	324,613

Source: Township General Administration Department, Taungtha

Total area of Taungtha township is 324,613 acres. Over 71 percent of it is cultivatable land and which is equivalent to 231,479 acres. (Township General Administration Department, 2017)

4.1.1 Farmland Ownership and Paddy Cultivation

In Taungtha township, up land (Ya land) covers majority of cultivatable land and it is followed by mixture of low land (paddy land) and up land (Ya Land).

Table 4. 5: Farmer households and their farmlands status by type (as of March, 2019)

Sr. No.	Type of farm land	Owner	Acre
1	Low land (Paddy land)	2,982	3,409
2	Up land (Ya)	36,498	139,704
3	Silty land (Kaing Kyun)	1,090	2,737
4	Mixture of Low Land and Up Land	17,936	87,514
5	Mixture of Low Land and Silty Land	250	578
6	Mixture of Up Land and Silty Land	496	2,588
7	Others	85	944
	Total	59,337	237,474

Source: Department of Agricultural Land Management and Statistics, Taungtha

According to 2019 record of the Taungtha Township Department of Agricultural Land Management and Statistics, there are 237,474 acres of cultivatable land in the township and 59,337 farmers own those lands.

Table 4. 6: Farmer households and their farmland by range of land ownership (as of March, 2019)

Sr. No.	Range of land ownership	Owner	Acre
1	Under 5 acres	42,422	82,924
2	Between 5 acres to 10 acres	12,393	83,638
3	Between 10 acres to 20 acres	3,127	39,401
4	Between 20 acres to 50 acres	1,384	30,855
5	Between 50 acres to 100 acres	11	656
6	Over 100 acres	-	-
	Total	59,337	237,474

Source: Department of Agricultural Land Management and Statistics, Taungtha

About 71.5 percent of total farmers own about 35 percent of total farm land in the township and they have less than five acres individually. Whilst 20.89 percent of farmers own between 5 – 10 acres of farm land, 5.27 percent own between 10 – 20 acres of farm land, 2.33 percent own 20 – 50 acres of farm land, only 0.02 percent own between 50 – 100 acres of farm land and no one in the township own above 100 acres of farm land. It can be concluded that majority of the farmers in the township are small-scale farmers.

Table 4. 7: Status of monsoon paddy cultivation in 2018 - 2019 (as of Sep 2019)

Sr. No.	Sources of water	Number of villages	Number of farmers (head)	Cultivated land (acre)
1.	Irrigated by river water pumping	7	2,010	1,554
2.	Irrigated from dams/lakes	13	924	1,110
4.	Rain-fed	7	97	127
5.	Others	9	2,391	1,621
	Total	36	5,422	4,412

Source: Township Department of Agriculture, Taungtha

Paddy is cultivated in Taungtha township where there is favour of water availability. There are several water sources in the township to cultivate paddy. They are rain fed, irrigation from dams, irrigation from lakes, irrigation by river water pumping and river tide. Rain fed, irrigation from dams and irrigation from lakes are very depended on rain fall. River tide also depends on the status of rain fall in upper area of Ayeyarwady river basin. There are two projects of irrigation by river water pumping in the township, which are Kyaw Zi and Seik Nyan. Only the farmers from those project areas can cultivate the paddy in every year. There four dams in the township which can support to agriculture and they are Kyauk Ta Lone dam, Tha Met Ku dam, Taungtha dam and Wea Laung dam. There are two lakes, named Kyauk Tan (right) and Ma Kyi Pin, can also support to agriculture if they have favour of the rain. (Township Department of Agriculture, 2018) There are 59,337 farmers who live in across the township (DALMS, Farmer households and their farmland ownership status in March 2019, 2019). In which, only 5,422 farmers cultivated monsoon paddy in financial year 2018 – 2019 (Township Department of Agriculture, 2018). It represents that only 9.14 percent of total farmers in the township could cultivate monsoon paddy in that financial year.

Table 4. 8: Paddy cultivation by variety and financial years

Sr. No.	Varieties	Cultivated area by financial year (acre)							
		2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016	2016 - 2017	2017 - 2018	2018 - 2019
1	Manaw Thukha	3678	1877	2481	1835	1924	2076	2663	2050
2	Sin Thukha	1823	2603	1954	2699	1991	1614	1535	2037
3	Parle Thwe	-	106	160	223	469	208	36	86
4	Thukha Hmwe	-	15	15	-	-	-	-	-
5	Ayeyar Padathar/ Others	-	-	-	5	184	360	237	239
	Total	5501	4601	4610	4762	4568	4258	4471	4412

Source: Township Department of Agriculture, Taungtha

Total cultivated area in current year, financial year 2018 – 2019, is 4,412 acres and which is the second lowest year since financial year 2011 – 2012, where it was 5,501 acres. Manaw Thukha and Sin Thukha have occupied majority of the cultivated area. They took over 86 percent in average in each year. In specific, they took 100 percent of cultivated in financial year 2011 – 2012, 97 percent in financial year 2012 – 2013, 96 percent in financial year 2013 – 2014, 86 percent in financial year 2014 – 2015, 87 percent in financial. year 2015 – 2016, 94 percent in financial year 2017 – 2018 and 93 percent in the financial year 2018 – 2019 respectively (*Township Department of Agriculture, 2018*). As of September 2018, only 88.24 percent of planed area was cultivated which is equivalent to 4,412 acres. 60.38 percent of them are located in irrigated area while the rest 39.62 percent is cultivated in rain fed and other water sources areas (*Township Department of Agriculture, 2018*). In there, four varieties are cultivated and they are Manaw Thukha, Sin Thuhka, Parle Thwe and Ayeyar Padathar. Manaw Thukha is cultivated in 2,050 acres and which is 46.46 percent of total paddy cultivated land in this financial year. Sin Thukha follows with 46.17 percent, Parle Thwe with 1.95 percent and Ayeyar Padathar with 5.42 percent respectively (*Township Department of Agriculture, 2018*).

4.2 Survey Method

Small-scale farmer is a farmer who possess the farmland up to, country's average farm size, five acres (Mar Mar Kyu, n.d). Within the range of the resources allowed, a survey was carried out in the township to identify major obstacles which is being faced by small-scale farmers who cultivate the paddy. It was run via household questionnaire. It tried to understand the situation they experienced in last three year and obstacles encountered in the year where the survey is carried out. So that the survey targeted to small-scale farmer who cultivated the paddy, at least, in the last three years ago. Among the paddy fields, based on the water availability, only the area where is irrigated by river water pumping could support the survey as other areas were very depended on the rain and some of them could not even cultivated the paddy in some years. So that, survey was limited to collect the data from the small-scale farmers who cultivated the paddy in irrigated fields by river water pumping in the last three years ago. There are seven villages where paddy fields are irrigated by river water pumping, named – Kyaw Zi, Da Maik Thar, Minn Kyo, Ta Ling Te, Sin Hpyu, Kan Taw (East)

and Kyar Poet villages. Survey asked the questions to 120 farming households from four villages in that area (named Kyaw Zi, Minn Kyo, Sin Hpyu and Da Maik Thar villages) who possess up to five acres of cultivatable land and have cultivated paddy, at least, since last three years. As the survey was carried out in four out of those seven villages, it reached to 57.14 percent of targeted villages.

4.3 Survey Result

Survey was a household survey and it targeted to the small-scale farmers in the Taungtha township who possess up to five acres of farmland and have cultivated, at least, in the last three years. Survey questionnaire was designed based on the findings of international scholars regarding challenges of small-scale farmers in the developing countries. It consists of nine sections, named 1) general, 2) land ownership, 3) paddy cultivation, 4) technology, 5) seeds, 6) finance, 7) market access, 8) labour, and 9) others.

4.3.1 Characteristic of Participants

The survey was carried out in four villages, named Kyaw Zi, Minn Kyo, Sin Hpyu and Da Maik Thar villages). Head of the household, household size, migrant people in the household are observed. Age and education level of respondents were also examined.

Table 4. 9: Respondents by village

Village	Respondent			Head of household			Size of household			Migrant people in the household
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Kyaw Zi	12	4	16	12	4	16	42	47	80	9
Minn Kyo	9	4	13	10	3	13	23	41	64	10
Sin Hpyu	34	5	39	34	5	39	94	98	192	13
Da Maik Thar	45	7	52	45	7	52	116	133	249	26
Total	100	20	120	101	19	120	275	319	585	58

Source: Survey data (2019)

There were 120 farmer household participated in the survey. Out of that 15.83 percent of responded households are led by women. 20 female respondents took part the survey and which is equivalent to 17 percent of total respondent. 95 percent of those female respondents are from woman-headed households.

Table 4. 10: Age and education level of participant

Village	Age							Education level				
	31-40 years	41-50 years	51-60 years	61-70 years	71-80 years	81-90 years	Total	Primary	Secondary	Graduated/	University	Total
Kyaw Zi	2	2	4	6	1	1	16	5	8		3	16
Minn Kyo	3	3	2	4	1	-	13	8	5		-	13
Sin Hpyu	5	8	14	7	3	2	39	16	21		2	39
Da Maik Thar	7	12	12	13	8	-	52	36	16		-	52
Total	17	25	32	30	13	3	120	65	50		5	120

Source: Survey data (2019)

Majority of respondent's education level is at primary level and it represents 54 percent of total respondents. It is followed by secondary level with 41.67 percent and graduated or university level with four percent respectively. The eldest person of respondents is 89 years old while the youngest one is 31 years old. The median age is 57.5 year and the mode is 80 year. There are 8 respondents who are 80 years old. The average household size of the respondents is 5.6 while the smallest is 2 and the largest is 10. 31 percent of respondent households have at least one family members who are working at away from their home in order to support family. Some households even have three family members who are working at away. In those households, there is no changes in number of family members who are working at away if it is compared between last three year and this year.

4.3.2 Land Holding by the Respondent Households

This survey asked the respondent household about their land ownership both in current year and in the last three years in order to if there is changes and reasons behind it.

Table 4. 11: Land ownership of participant in 2019

Village	Under 1 acre		1 – 2 acres		2 – 3 acres		3 – 4 acres		4 – 5 acres		Total	
	Current year	Last 3 years	Current year	Last 3 years	Current year	Last 3 years	Current year	Last 3 years	Current year	Last 3 years	Current year	Last 3 years
Kyaw Zi	6	6	7	7	3	3	-	-	-	-	16	16
Minn Kyo	4	4	4	4	5	5	-	-	-	-	13	13
Sin Hpyu	7	6	11	10	13	15	5	5	3	3	39	39
Da Maik Thar	11	11	20	20	15	15	6	6	-	-	52	52
Total	28	27	42	41	36	38	11	11	3	3	120	120

Source: Survey Data (2019)

Average size of the land owned by the participants is 2.27 acres. The mode range of the land ownership 1 - 2 acres. There are 42 respondent households are in this range in current year. The smallest size of farm land is 0.5 acre while the largest one is 5 acres. Apart from three households, the rest households do not have any changes on their land ownership since last three years. For those three households, they have given some portion of the land they owned to their children.

Table 4. 12: Land ownership of participant in 2019 (by type and water sources)

Village	Farmland by type (acre)			Farmland by water sources (acre)				
	Low land	Up land	Total	Rain-fed	Irrigated from dam/lake	Irrigated by river water	Others	Total
Kyaw Zi	28.0	-	28.0	-	-	28.0	-	28.0
Minn Kyo	24.5	-	24.5	-	-	24.5	-	24.5
Sin Hpyu	101.5	-	101.5	-	-	101.5	-	101.5
Da Maik Thar	108.8	-	108.8	-	-	108.8	-	108.8
Total	262.8	-	262.8	-	-	262.8	-	262.8

Source: Survey data (2019)

Type of the farmland possessed by all the participants are low land and they all are laid in the area where irrigated by river water pumping for cultivation.

4.3.3 Paddy Cultivation

Status of cultivated area, average yield per acre, cost per acre and income per acre for paddy cultivation of respondent households were observed. Farmers were asked their status of those area both in current year and in the last three year in order to know if there is changes and reason behind it.

Table 4. 13: Comparison of cultivated area and average yield per acre between current year and last three years

Village	Cultivated area (acre)			Average yield per acre (basket)		
	Current year	Last 3 years	Diff (%)	Current year	Last 3 years	Diff (%)
Kyaw Zi	28.0	29.0	-3.4	77.8	76.3	2.0
Minn Kyo	24.5	24.5	0.0	73.1	71.8	1.8
Sin Hpyu	95.5	102.5	-6.8	80.3	71.0	13.0
Da Maik Thar	105.8	107.3	-1.4	82.6	77.1	7.2
Total	253.8	263.3	-3.6	80.2	74.4	7.7

Source: Survey data (2019)

Total paddy cultivated area in current year is 253.8 acres and it was 3.6 percent decreased from paddy cultivated area in the last three year, 263.3 acres. Some farmers have given some portion of their farmlands to their children. Other major reason for shrinking is scarcity of water. Although cultivated area was shrunk, average yield per acre was increased in 7.7 percent. Average yield per acre for the financial year 2018 – 2019 is 80.2 baskets and which is improved from 74.4 baskets in last three years. Only three percent of total respondents encountered that their yield per acres has declined. 75 percent of those farmers reduced their investments than they did in last three years.

Table 4. 14: Comparison of average cost and income per acre between current year and last three years

Village	Average cost per acre (MMK)			Average income per acre (MMK)		
	Current year	Last 3 years	Diff (%)	Current year	Last 3 years	Diff (%)
Kyaw Zi	273,750.0	265,625.0	3.1	364,687.5	363,125.0	0.4
Minn Kyo	279,230.8	241,538.5	15.6	362,500.0	357,083.3	1.5
Sin Hpyu	305,384.6	261,538.5	16.8	392,051.3	355,128.2	10.4
Da Maik Thar	273,865.4	251,153.8	9.0	413,461.5	383,750.0	7.7
Total	284,675.0	255,416.7	11.5	394,747.9	368,907.6	7.0

Source: Survey data (2019)

Average cost per acre for paddy cultivation in current year is MMK 284,675 which was increased by 11.5 percent from the cost in the last three years, MMK 255,416.7. Average income per acre in current year was also increased in 7.0 percent from the last three years. But it was increased in one digit while average cost per acre was increased in two digits.

4.3.4 Technologies

This survey asked the farmers about their practices for paddy cultivation, sources of technologies they have been transferred and usefulness of technologies transferred.

Table 4. 15: Technology usage for cultivation and threshing

Village	Use more machine		Ways to cultivate				Ways to thresh			
	Yes	No	Both	Machine only	Man/animal power only	machine usage (%)	Both	Machine only	Man/animal power only	machine usage (%)
Kyaw Zi	16	-	3	1	12	25	1	15	-	100
Minn Kyo	9	4	3	1	9	31	3	2	8	38
Sin Hpyu	17	22	15	3	21	46	5	11	23	41
Da Maik Thar	50	2	33	1	18	65	17	18	17	67
Total	92	28	54	6	60	50	26	46	48	60

Source: Survey data (2019)

The survey shows that 77 percent of respondent farmers have used more machinery services than they used in last three years. They used pure machinery services more in threshing than cultivation. However, increment of machine usage in threshing is higher it is in cultivation. Farmers would like to use machines more and it is linked to the scarcity of labour in the area. 25 percent of total respondent farmers demand on government to hire them a greater number of machines.

Table 4. 16: Technologies used for paddy cultivation

Village	Technology used is rolled back		Technologies used for paddy cultivation		
	Yes	No	Modified technologies	New technologies	Traditional ways
Kyaw Zi	-	16	1	15	-
Minn Kyo	-	13	5	1	7
Sin Hpyu	-	39	21	10	8
Da Maik Thar	-	52	13	31	8
Total	-	120	40	57	23

Source: Survey data (2019)

Only 33 percent of respondent farmers are still using traditional ways in paddy cultivation. However, all of the respondent farmers confirmed that the ways they use for paddy cultivation is not rolling back. Farmers are more accessible to new technologies than last three years. There were 12 percent of total respondent farmers who were not able to access to new technologies but now it is down to 3 percent.

Table 4. 17: Sources of technologies transferred

Village	Government		Friends/relative		Private Companies		Other		No transferred	
	Current year	Last 3 years	Current year	Last 3 years	Current year	Last 3 years	Current year	Last 3 years	Current year	Last 3 years
Kyaw Zi	16	16	-	-	-	-	-	-	-	-
Minn Kyo	8	3	5	7	-	-	-	-	-	3
Sin Hpyu	31	8	6	24	-	-	-	1	2	6
Da Maik Thar	47	29	4	18	-	-	-	-	1	5
Total	102	56	15	49	-	-	-	1	3	14

Source: Survey data (2019)

The survey shows that Township Department of Agriculture is the most reliable source for new technologies. Getting the new technologies from friends or relatives has been declined significantly, from 41 percent to 13 percent of total respondent farmers. But it cannot be assumed that peer discussion among the farmers is getting low.

Table 4. 18: Appropriateness of and willingness to technologies

Village	Appropriateness of technologies transferred					Willingness to learn new technologies				
	Very useful	Useful	No opinion	Inconvenience	Useless	Enthusiastically	Interested	No opinion	Not interested	Not at all
Kyaw Zi	14	2	-	-	-	15	1	-	-	-
Minn Kyo	3	10	-	-	-	4	9	-	-	-
Sin Hpyu	16	23	-	-	-	21	18	-	-	-
Da Maik Thar	35	17	-	-	-	30	22	-	-	-
Total	68	52	-	-	-	70	50	-	-	-

Source: Survey data (2019)

All of the respondent farmers are satisfied on the technologies they have been transferred and confirmed that those technologies are useful for them. They could help live of farmers easier than before. This survey notices that all of those farmers are very interested to learn about better technologies for paddy cultivation. In which, 58 percent of respondents showed their enthusiasm on learning of better technologies for paddy cultivation.

4.3.5 Seeds

Survey asked the farmers about their accessibility to quality seeds and their purchasing pattern on seeds and other inputs.

Table 4. 19: Accessibility to quality seeds and purchasing pattern

Village	Accessibility to quality seeds		Purchasing pattern for seeds and inputs		
	Yes	No	Individually	Collectively	Others
Kyaw Zi	16	-	11	5	-
Minn Kyo	13	-	13	-	-
Sin Hpyu	39	-	22	17	-
Da Maik Thar	52	-	36	16	-
Total	120	-	82	38	-

Source: Survey data (2019)

This survey says that all of the respondent farmers are able to get good quality seeds in the region. Most the farmer are still using the traditional way to purchase the inputs for their farms. 68 percent of the respondent farmers purchase the inputs by their own plan while other 32 percent of respondents purchase collectively.

4.3.6 Finance

This survey asked respondent farmers about their agricultural loans and major income sources. Sources of loan, its interest rate, sufficiency, ability of farmers to return their loans and coping mechanism were observed.

Table 4. 20: Sources for agricultural loan

Village	Government		Lenders		Relatives		Others		No loan taken	
	Current year	Last 3 years	Current year	Last 3 years	Current year	Last 3 years	Current year	Last 3 years	Current year	Last 3 years
Kyaw Zi	15	11	-	-	-	-	-	-	1	5
Minn Kyo	1	1	-	-	-	-	-	-	12	12
Sin Hpyu	34	31	-	-	-	-	-	-	5	8
Da Maik Thar	42	42	-	-	-	-	-	-	10	10
Total	92	85	-	-	-	-	-	-	28	35

Source: Survey Data (2019)

Number of farmers who are getting the agricultural loan from the government is slightly increased. Number of farmers who are not getting the loan is decreased from 35 people in last three years to 28 people in this year. It means that 20 percent of more farmers are getting the loan for their cultivation. Myanmar Agricultural Development Bank is only the source where the respondent farmers get their agricultural loans.

Table 4. 21: Farmers' expression on loan from government

Village	Loan package is					Interest rate is				
	Sufficient	Not bad	No opinion	Low	Insufficient	Too high	High	No opinion	Fair	Low
Kyaw Zi	11	1	-	-	4	-	-	-	-	16
Minn Kyo	-	1	-	-	-	-	-	-	1	-
Sin Hpyu	5	-	-	-	29	-	-	-	1	33
Da Maik Thar	1	5	-	-	36	-	1	-	9	32
Total	17	7	-	-	69	-	1	-	6	81

Source: Survey Data (2019)

Most of the farmers prefer the agricultural loan from government bank, Myanmar Agricultural Development Bank as its interest rate is relatively low. 87 percent of respondent farmers who got the loan from Myanmar Agricultural Development Bank confirmed that its interest rate low for them. However, they cannot satisfy on the size of the loan package. 74 percent of respondent farmers who got the loan from that bank remark that size of the loan package they got is not sufficient to cover the actual cost.

Table 4. 22: Paying back the loan by income from paddy cultivation

Status of pay back the loan	Status of income from paddy cultivation to pay back loan			Total
	Enough	Partially	Not at all	
Fully paid	59	22	2	83
Partially paid	0	9	1	10
Total	59	31	3	93

Source: Survey data (2019)

No one from the farmers who got the loan from Myanmar Agricultural Development Bank could not pay back the loan and its interest. 89 percent of the farmers who got the loan could pay back the loan and its interest fully while other 11 percent of farmers were able to pay it back partially.

Table 4. 23: Coping mechanism for outstanding loan

Village	Borrow money from			Sold assets		Other
	Lender	Relatives	Bank	Farmland	Family assets	
Kyaw Zi	-	3	-	-	2	2
Minn Kyo	-	1	-	-	-	-
Sin Hpyu	1	7	-	-	-	-
Da Maik Thar	5	10	-	-	-	-
Total	6	21	-	-	2	2

Source: Survey data (2019)

Sixty three percent of those farmers had enough income from their paddy cultivation to pay back their loan. However, 33 percent of the farmers were partially supported to pay back their loan by the income from their paddy cultivation while only three percent were not able to pay back the loan by the income from their paddy cultivation. For those who were not able to pay back their loan fully, their relatives are the most reliable source for them to cope. Only six percent of the respondent farmers who were not able pay back their loan had to sell their assets while another 19 percent of the farmers got new loan from lenders in the region.

Table 4. 24: Major income sources for small-scale farmers

Village	Agriculture	Remittance/Support of children in the village	Trading	Others
Kyaw Zi	11	5	-	12
Minn Kyo	13	6	-	4
Sin Hpyu	39	22	-	-
Da Maik Thar	49	26	6	3
Total	112	59	6	19

Source: Survey data (2019)

Survey shows that 39 percent of total respondents rely on single income source. Out of that, 87 percent depend on the income from agriculture. It is equivalent to 34 percent of total respondents. 49 percent of total respondent farmers still rely on the remittance and support from their children in the village. There are only 16 percent of respondent who have income source from non-agricultural sector.

4.3.7 Market Access

Survey also observed about how farmers utilized their outputs. Some farmers sold their outputs. Follow up observation were made to understand about market they sold the output, marketing channels they used, and price they obtained.

Table 4. 25: Market, buyers and price

Village	Had to sell paddy for money		Buyers in the market			Price was fair				
	Current year	Last 3 years	Always	Sometime	No buyer	Strongly agree	Agree	No opinion	disagree	Strongly disagree
Kyaw Zi	12	16	12	4	-	13	3	-	-	-
Minn Kyo	8	8	12	1	-	11	2	-	-	-
Sin Hpyu	38	39	29	10	-	28	11	-	-	-
Da Maik Thar	47	48	43	8	1	48	4	-	-	-
Total	105	111	96	23	1	100	20	-	-	-

Source: Survey data (2019)

In the last three years, 93 percent of respondent farmers had to sell their paddy as they needed money urgently but now only 88 percent of the respondents did it. Situation of five percent of farmers were improved to avoid selling the paddy urgently. 80 percent of the respondents confirm that they could sell their paddy in the market anytime they need while another 19 percent of the respondents could sometimes. There was only one farmer who could not find the buyer in the market when he wanted to sell

his paddy. Almost all the participants satisfied on the price they got when they sold their paddy. 17 percent of total respondents were slightly satisfied the price they got but other 83 percent were very satisfied.

Table 4. 26: Output utilization, market and marketing channels

Village	Utilization of outputs			Market sold			Marketing channel	
	Domestic consumption only	For sale only	Both	Within/Village nearby	Taungtha	Others	Via brokers	Direct sale
Kyaw Zi	1	15	-	15	-	-	1	15
Minn Kyo	1	12	-	9	-	3		12
Sin Hpyu	3	8	28	35	-	1	3	33
Da Maik Thar	-	48	4	41	3	9	2	50
Total	5	83	32	100	3	13	6	110

Source: Survey data (2019)

There are five households which used all of their outputs for domestic consumption only. Out of the rests, 72 percent of them used their outputs for sale only while another 28 percent used it for both of domestic consumption and selling. Most of the farmers used to sell their paddy within their villages or the villages nearby. Very few amounts of the farmers sold their paddy at the market in Taungtha. There are 109 farmers sold their paddy directly in the market but another five farmers sold it via brokers. There is a farmer in Kyaw Zi village and he used both channels for marketing.

4.3.8 Labour

As labour plays in key role at paddy cultivation, the survey observed about labour availability in the market and its effects on paddy cultivation.

Table 4. 27: Labour availability

Village	Labour scarcity is more intense					Labour in the market				Damages/Losses due to labour scarcity				
	Strongly agree	Agree	No opinion	Disagree	Strongly disagree	Easy to get	Fairly hard to get	Very hard to get	No opinion	Strongly agree	Agree	No opinion	Disagree	Strongly disagree
Kyaw Zi	3	13	-	-	-	-	13	3	-	4	3	-	9	-
Minn Kyo	-	12	-	1	-	1	12	-	-	-	3	-	10	-
Sin Hpyu	-	39	-	-	-	-	39	-	-	-	9	-	30	-
Da Maik Thar	14	38	-	-	-	-	43	9	-	-	26	-	26	-
Total	17	102	-	1	-	1	107	12	-	4	41	-	75	-

Source: Survey data (2019)

Skilled labour availability in the township is more scarce than last three years. It is confirmed by almost all of respondents. They also stress that it is difficult to hire skill labour when they are needed. There are two points cause scarcity of labour. They are migration and low wage for the labour. 37 percent of respondent experienced damages or losses due to the scarcity of labour.

4.3.9 Major obstacles and their drivers

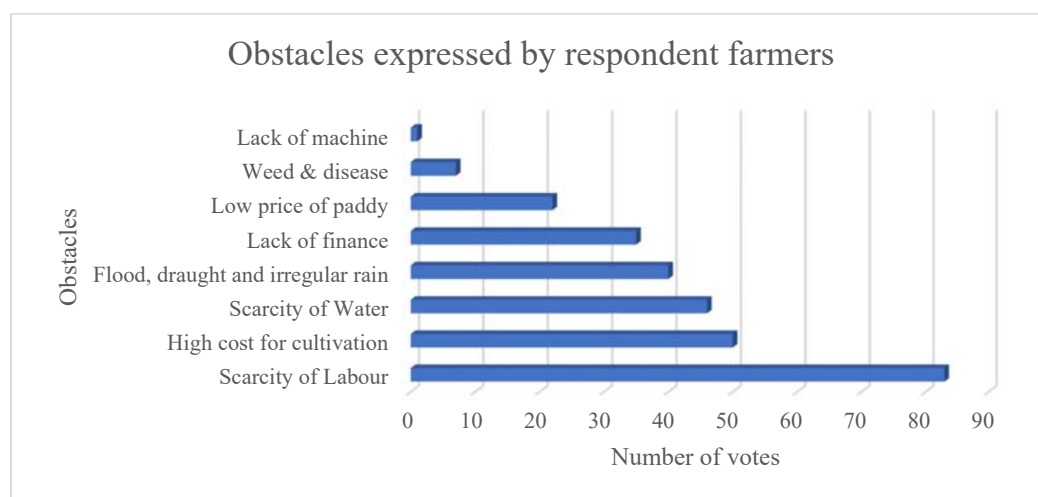
This survey opened the space for small-scale farmers to express the major obstacles which currently impact on their paddy cultivation.

Table 4. 28: Obstacles expressed by respondents

Obstacles for small-scale farmers	Number of votes
Scarcity of Labour	83
High cost for cultivation	60
Scarcity of Water	46
Flood, draught and irregular rain	40
Lack of finance	35
Low price of paddy	22
Weed & disease	7
Lack of machine	1

Source: Survey data (2019)

Figure 4. 1: Obstacles expressed by respondents



Source: Survey data (2019)

Respondent farmers voted scarcity of labour as a major obstacle which significantly impacts on the small-scale farmers in the region. It has been voted almost double than high cost for cultivation which is the second most voted obstacle. Climate change also stands as a major obstacle and it is followed by lack of finance. Farmers stressed that cost of cultivation is getting higher in which price of fertilizer is more expensive than last years. They are also obstacles for the farmers. Moreover, market price of paddy at the harvesting time is low and farmers also pointed it as a major obstacle for them.

Table 4. 29: Root causes expressed by respondents

Root causes	Number of voting
Poor quality of distribution channels	50
Inputs are expensive	48
Migrations	44
Volatile of paddy price	20
Climate change	19
Fertilizer are expensive	17
Low amount of government loan	17
Low wage for labour	8
Poor weed and disease control	3
Small cultivation acre	2
Lack of machine	1
Limited tractors in area	1
Inflation	1

Source: Survey data (2019)

Survey also asked the respondents to express their opinion on root causes which caused the obstacles they expressed before. Farmers have difficulty to have the water enough for their paddy cultivation due to poor quality of distribution channels. Farmers described that cost for paddy cultivation has increased in which fertilizer are more expensive than its price in the last three years. Migration and low wage cause the scarcity of labour. Volatile of paddy price and low amount of government loan make the farmer who is financially vulnerable for paddy cultivation.

The survey observes a vicious cycle in targeted area, especially on scarcity of skill labour and lack of finance. Farmers encountered labour shortage as a major obstacle for paddy cultivation. Although inputs cost is high, most of the farmers in the area had to manage to invest their resources for paddy cultivation as it is primary livelihood for their families. As price of fertilizer is getting higher, they could not put enough amount of fertilizer into their paddy farm. On the other hand, they have struggled to have water enough due to poor quality of distribution channels. Climate change, especially draught and irregular rain-fall pattern, poured the fuel on the flame. These factors effects on total income of the farmers from their paddy cultivation. Moreover, farmers are not guaranteed on the paddy price what they can expect at harvesting time. So that farmers have more ambiguous for paddy cultivation and have also limitation to increase labour wages. This discourage labour to take part in paddy cultivation and some of them have left their origin in order to generate more income for supporting their families. It causes scarcity of labour in the region and makes the farmers more struggle to get skilled labour in time. It also gives additional transactions costs to the farmers.

4.4 Summary of Survey Data Analysis

This survey found that availability of water is a big challenge for the small-scale farmers in the region. Farmlands in rain-fed area and irrigated from dam/lake area are obvious that they are very depend on the favour of rain. In some years, farmers in some of those areas could not able to cultivate the paddy. Even in the irrigated by river water pumping, some farmers in this area also has difficulty with water availability due to the poor quality of distribution channels. Scarcity of labour is pointed as a major challenge by almost all the respondents. Some small-scale farmers experienced lost or damages due to the scarcity of labour. Farmers had to sell their paddy at harvesting time as they

need money even though the price was not good for them. Loan from the government is insufficient to cover their cultivation cost. On the other hand, input prices are getting higher especially the price of fertilizer. Those factors make the small-scale farmers not able to increase the wage for the labour. So that labours have to migrate from their origin in order to support their families. It causes the labour scarcity in the region and farmers have additional transaction cost consequently. Small-scale farmers are expecting government assistance to hire more machines to mitigate the labour issue. Average income per acre was increased than it was in the last three years. However, average cost per acre was also increased and it was increased more than the increment of average income per acre.

Myanmar Agricultural Development Bank is only the source for small-scale farmers in the region to get agricultural loan. Its interest rate is low but the loan package is insufficient to cover the cultivation cost. Number of small-scale who get the loan from the government was increased. Most of the small-scale farmers who got the loan from the government were able to paid back their loan. For some small-scale farmers, income from paddy cultivation could not fully cover to pay back the loan. Assistance from the relatives is the most reliable source for them to cope it. Very few small-scale reported that they had to sell their assets to solve the loan issue. All the farmers are able to get the quality seeds in the region. Most of the small-scale farmers engaged the market, to buy inputs and to sell outputs, individually while very few farmers did it collectively. Most of small-scale famers sold their output while very few farmers used their outputs for domestic consumption only. 28 percent of total respondents use their outputs for both sale and domestic consumption. They sold their outputs mainly within the village or the villages nearby. Only very few farmers sold at Taungtha market. Most of the farmer sold their paddy in the market directly while only five percent of respondents sold it via brokers.

All the respondents confirmed the technologies they used for cultivation was not rolled back and some of them reported that they used more machine than they did in the last three years. Department of Agriculture is the main source for the small-scale farmers in the region to get the new technologies. Almost all the farmers are interested to learn about better technologies for paddy cultivation and they expected the Department of Agriculture more to have extension service and technology transfer. This

survey was not reported that Foreign Direct Investments, FDIs, do not affect small-scale farmers in the region yet unlike international scholars found it in other developing countries.

CHAPTER V

CONCLUSION

5.1 Findings

Draught is one of the characteristics of the Dry Zone. Precipitation for Taungtha township is low. Irregular rain fall pattern and low rain fall can cause uncertainties to the farmers. This survey found that availability of water is a big challenge for the small-scale farmers in the region. Farmlands in rain-fed area and irrigated from dam/lake area are obvious that they are very much depend on the favour of rain. In some years, farmers in some of those areas could not even able to cultivate the paddy. Even in the irrigated by river water pumping, some farmers in this area also has difficulty with water availability due to the poor quality of distribution channels. Current irrigation infrastructure, especially distribution channels, need to be upgraded. Moreover, new infrastructure will also need in order to provide sufficient water for paddy cultivation, especially in rain-fed areas.

Another major obstacle of small-farmers in the regions is scarcity of labour that made some small-scale farmers experienced lost or damages. Farmers had to sell their paddy at harvesting time even though they could not satisfy the price at that time. Moreover, inputs like fertilizer are expensive and loan from the government is insufficient. With these reasons, it is difficult for the small-scale farmers to increase the wage for the labour. So that labours have to migrate from their origin in order to support their families. It causes the labour scarcity in the region and farmers have additional transaction cost consequently. Small-scale farmers are expecting government assistance to hire more machines, especially tractors, to mitigate the labour issue. Mechanization could ease the farmers from the scarcity of labour and the farmers demand the government to hire more tractors. However, there is no government own Agricultural Tractor Station, ATS, exists in the township. The nearest stations are located in Myingyan and Nyaung-Oo townships but total number of assigned tractors

in those stations are declining year by year. Farmers should be able to access the machinery service whenever they need it, in order to remedy the labour issue.

A cost per acre was increased more than the increment of average income per acre. Myanmar Agricultural Development Bank is only the source for small-scale farmers in the region to get agricultural loan. Its interest rate is low but the loan package is insufficient to cover the cultivation cost. For some small-scale farmers, income from paddy cultivation could not fully cover to pay back the loan. Assistance from the relatives is the most reliable source for them to cope it. Very few small-scale reported that they had to sell their assets to solve the loan issue. MADB has increased volume of its agricultural loan year after year for the whole country including Mandalay Region. However, cost of paddy cultivation and loan from MADB is insufficient to cover are realities for the small-scale farmers.

All the farmers are able to get the quality seeds in the region. Most of the small-scale farmers sold their outputs directly to the market within the village or at the village year by year. They engaged the market, to buy inputs and to sell outputs, individually. So, bargaining power of individual will be weak. They could save some cost, especially transportation cost, if they engage the market collectively.

All the respondents confirmed that they used more machine than they did in the last three years. There is no ATS, Agriculture Tractor Station, exists in the township and number of assigned tractors at ATS in the nearest townships are getting low year by year. It worsens the effect of labour paucity in the region. In addition, no evidence was found that technology-advanced-machine are being used. Small-scale farmer should be more accessible to the machine, if it is possible especially to technology-advanced-machine as they are more cost efficient.

Department of Agriculture is the main source for the small-scale farmers in the region to get the new technologies. Almost all the farmers are interested to learn about better technologies for paddy cultivation and they expected the Department of Agriculture more to have extension service and technology transfer. This survey was not reported that Foreign Direct Investments, FDIs, do not affect small-scale farmers in the region yet unlike international scholars found it in other developing countries.

5.2 Suggestions

Small-scale farmers are majority in the agriculture where it employs the majority of rural people in Myanmar. Supports to the small-scale not only could help to increase their production but also it could help to improve the living status of rural people, ultimately it could support to the poverty alleviation.

Small-scale farmers should challenge themselves to change some of their practices. Farmer groups should be formed based on the adjacent of farmland not only to share the knowledge and experience but also to deal with stakeholders collectively. Through this platform, farmers could amplify their voice to be heard and necessary actions to be taken.

Agricultural spending needs to be prioritized in the public budget. Government should invest more or promote private sector to invest in upgrading irrigation facilities, inputs markets, mechanization and information technology for extension service. Government should also support small-scale farmers to develop associations that increase their access to key services, while also enabling them to link to and partner with local private sector companies and traders. Government should encourage private sector to invest more in agricultural sector with responsive manner.

Private sector should prioritize investments that support and work with local producers and markets, contributing to the success of the small-scale farmers rather than marginalizing them.

This study reached only to the area where farm lands are irrigated by river water pumping. Further studies are encouraged and recommended to explore challenges faced by the other farmers in the township.

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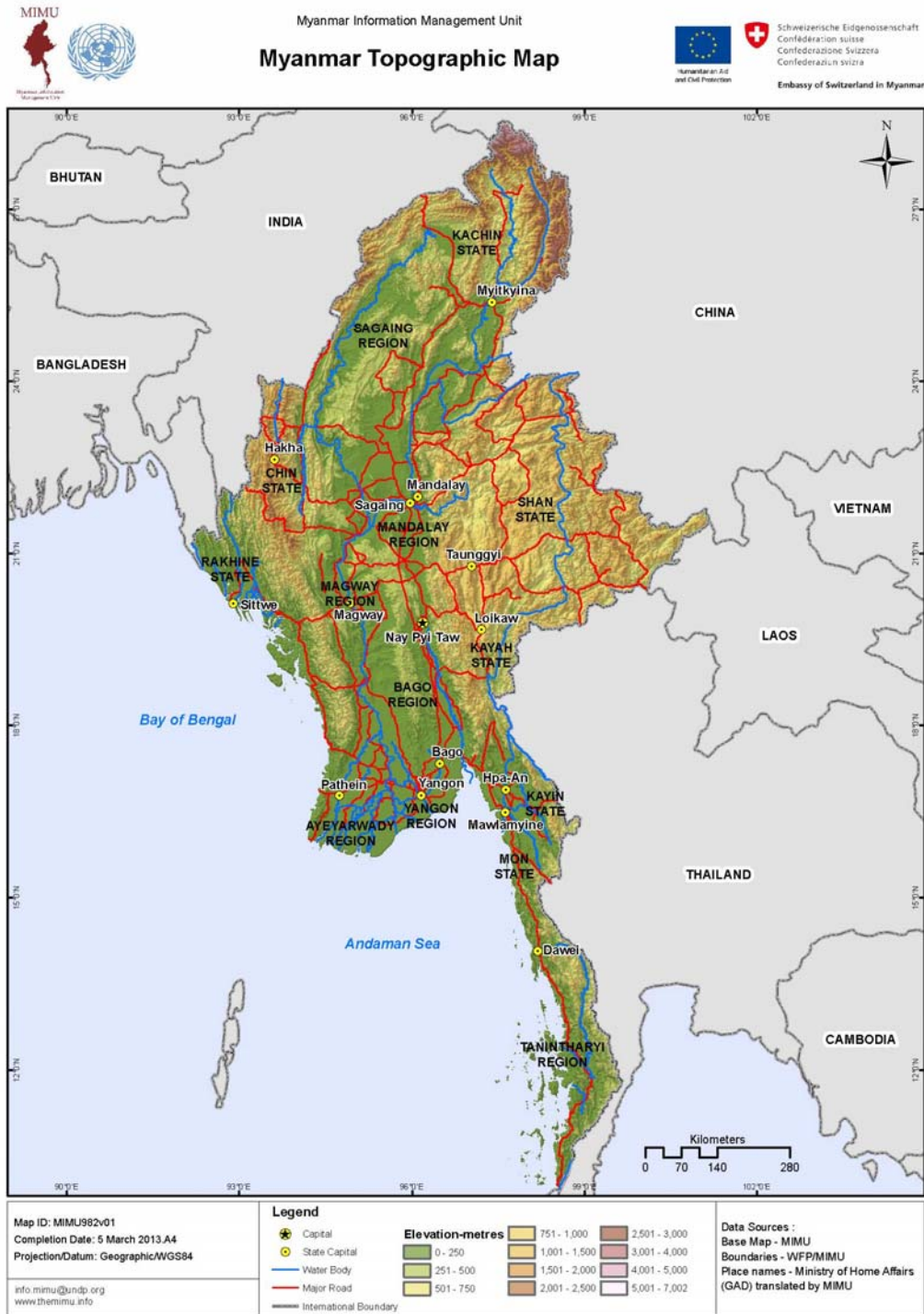
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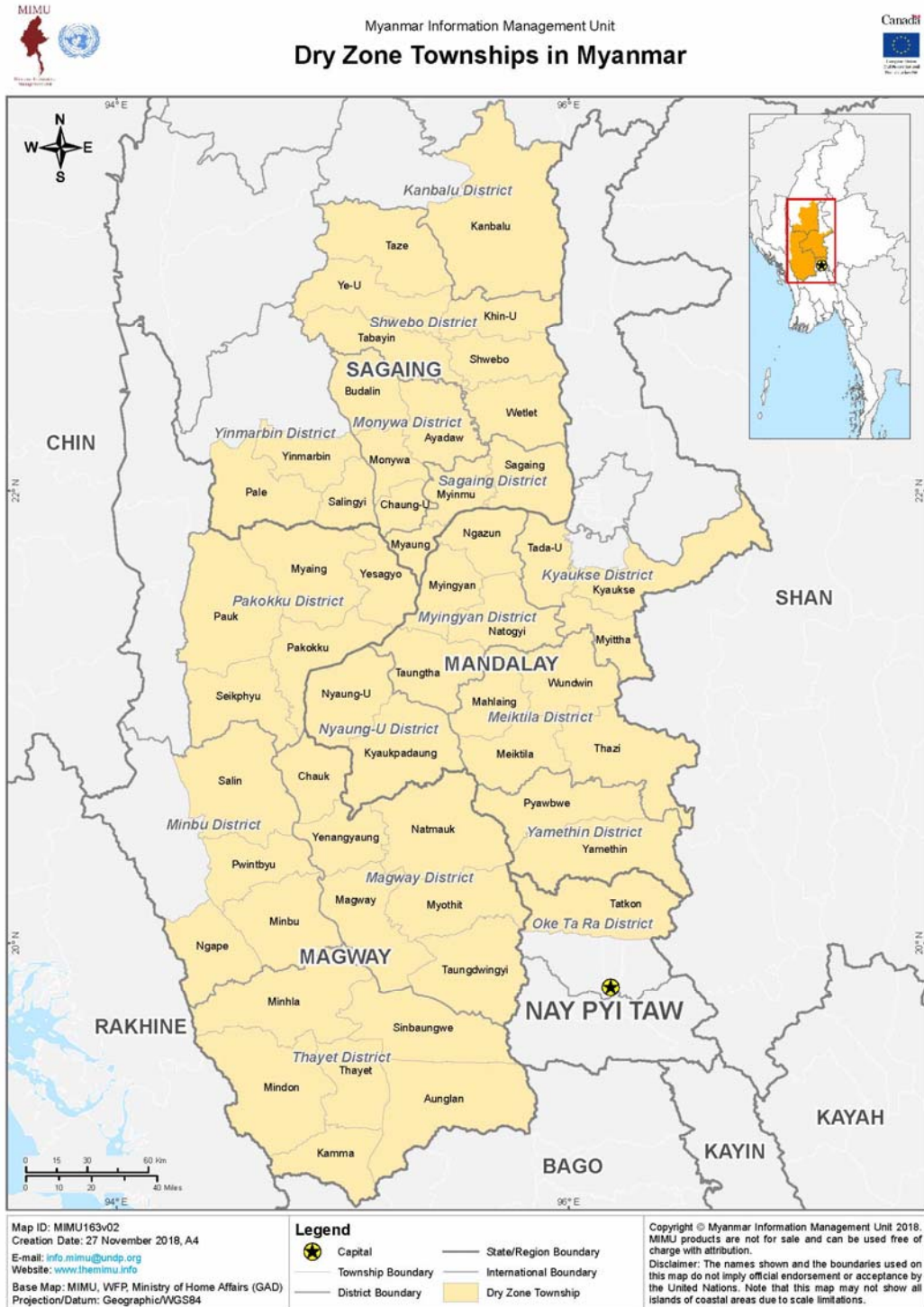
APPENDIX

Appendix 1: Myanmar Country Map



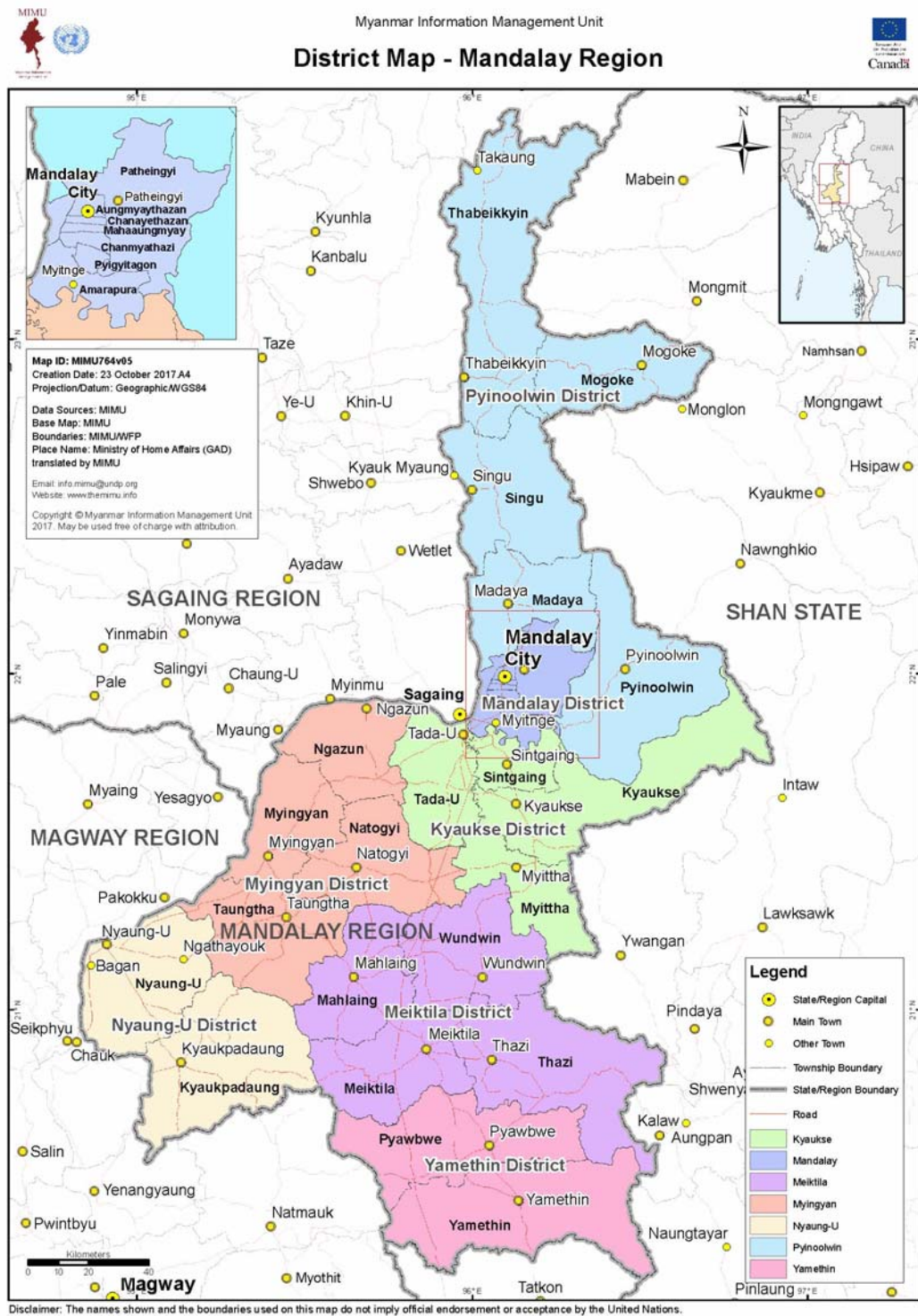
Source: Myanmar Information Management Unit (MIMU)

Appendix 2: Dry Zone Townships in Myanmar



Source: Myanmar Information Management Unit (MIMU)

Appendix 3: Map of Mandalay Region



Source: Myanmar Information Management Unit (MIMU)

Appendix 5: Expenditure of The Union Government by sector (absolute values in kyat millions)

Sector	2005 - 2006		2010 - 2011		2013 - 2014		2014 - 2015		2015 - 2016		2016 - 2017 (P.A)	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
TOTAL	2,353.41	100.00	7,505.72	100.00	14,280.21	100.00	21,291.55	100.00	18,923.65	100.00	18,367.93	100.00
Agriculture	122.75	5.22	282.05	3.76	546.00	3.82	541.61	2.54	615.51	3.25	514.97	2.80
Livestock and Fishery	17.82	0.76	39.99	0.53	135.37	0.95	357.81	1.68	328.69	1.74	320.00	1.74
Forestry	35.96	1.53	147.68	1.97	295.38	2.07	293.53	1.38	437.93	2.31	192.64	1.05
Mines	11.79	0.50	47.57	0.63	148.81	1.04	180.48	0.85	163.46	0.86	115.73	0.63
Industry	233.05	9.90	391.23	5.21	790.62	5.54	641.04	3.01	543.89	2.87	310.04	1.69
Energy	665.49	28.28	1,471.86	19.61	4,127.11	28.90	4,820.90	22.64	5,084.69	26.87	4,760.09	25.92
Construction	224.82	9.55	446.93	5.95	646.79	4.53	656.23	3.08	395.08	2.09	386.92	2.11
Transport and Communications	255.76	10.87	578.12	7.70	744.30	5.21	829.36	3.90	898.88	4.75	1,030.53	5.61
Social Services	97.77	4.15	478.97	6.38	2,224.47	15.58	3,604.63	16.93	4,330.03	22.88	4,494.08	24.47
Finance	135.12	5.74	464.38	6.19	676.73	4.74	727.15	3.42	912.93	4.82	1,147.12	6.25
Trade	6.65	0.28	15.57	0.21	20.09	0.14	57.67	0.27	24.45	0.13	17.04	0.09
Defence	197.79	8.40	1,297.05	17.28	2,222.58	15.56	2,471.34	11.61	3,141.15	16.60	2,949.99	16.06
Administration	348.53	14.81	1,843.88	24.57	1,529.34	10.71	1,678.37	7.88	1,924.58	10.17	2,072.04	11.28
Development	0.11	0.00	0.44	0.01	22.84	0.16	20.05	0.09	50.89	0.27	39.53	0.22
Committees	-	-	-	-	-	-	-	-	-	-	-	-
Nay Pyi Taw Council	-	-	-	-	-	-	4,411.39	20.72	71.48	0.38	17.20	0.09

Source: Myanmar Statistical Yearbook (2018)

Appendix 6: Paddy cultivation in Taungtha Township by financial year

Sr.	Varity	Cultivated land by financial year (acres)							
		2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
1	Manaw Thukha	3,678	1,877	2,481	1,835	1,924	2,076	2,663	2,050
2	Sin Thukha	1,823	2,603	1,954	2,699	1,991	1,614	1,535	2,037
3	Parle Thwe	-	106	160	223	469	208	36	86
4	Thukha Hmwe	-	15	15	-	-	-	-	-
5	Ayeyar Padathar and others	-	-	-	5	184	360	237	239
	Total	5,501	4,601	4,610	4,762	4,568	4,258	4,471	4,412

Source: Township Department of Agriculture, Taungtha

Appendix 7: Rice self-sufficiency ratio of Taungtha township

Sr.	Description	Unit	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
1	Population	head	240,110.00	241,364.00	24,992.00	244,431.00	246,658.00	247,620.00
2	Consumption per head							
	- Rural	basket	15.00	15.00	15.00	15.00	15.00	15.00
	- Urban	basket	12.00	12.00	12.00	12.00	12.00	12.00
3	Need home consumption	basket	3,551,721.00	3,570,330.00	3,594,303.00	3,615,426.00	3,648,243.00	3,662,352.00
4	Cultivated land	acre	5,535.00	5,706.00	5,026.00	4,755.00	5,295.00	4,953.00
	- Yield per acre	basket	83.05	88.51	90.12	86.82	88.44	87.50
	- Harvested production	basket	459,692.00	505,025.00	452,968.00	411,786.00	450,439.00	433,462.00
5	Forecast for next year cultivation	acre	6,130.00	8,450.00	4,732.00	6,500.00	6,500.00	6,500.00
6	Seeds for next year	basket	27,675.00	28,530.00	10,052.00	32,500.00	13,000.00	13,000.00
7	Actual consumption for this year	basket	3,551,721.00	3,570,330.00	3,594,303.00	3,615,426.00	3,674,718.00	3,687,117.00
8	Sufficiency	basket	(3,119,704.00)	(3,093,835.00)	(3,166,471.00)	(3,227,379.00)	(3,224,279.00)	(3,253,655.00)
9	Remain	basket	-	-	-	-	423,964.00	408,697.00
10	Self-Sufficiency Ratio	%	12.84	14.03	12.51	11.32	12.26	11.76

Source: Township Department of Agriculture, Taungtha

Appendix 8: Survey questionnaire

Household questionnaire

To explore major obstacles faced by small-scale farmers

(only ask small-scale farmers who possess 5 acres of farmland maximum and have cultivated paddy since last 3 years at least)

1. General			
Name of respondent		Sex of respondent <input type="checkbox"/> Male <input type="checkbox"/> Female	
		Sex of HH head <input type="checkbox"/> Male <input type="checkbox"/> Female	
Village tract		Village	
Number of family members		Male	Female
Family member who are working away from home		If it is compared to last 3 years, it is	
		<input type="checkbox"/> Increased	<input type="checkbox"/> Decreased <input type="checkbox"/> No changes
2. Land ownership			
Area of farmland possess (acres)		Reason if there is variance.	
This year			
Last year			
3. Paddy cultivation		Current year	Last 3 years
Area paddy cultivated (acres)			
Average yield per acre (baskets)			
Average cost per acre (MMK)			
Average income per acre (MMK)			
Reason/Opinion if there is variance.			
4. Technology			
I'm using more machinery services than in last 3 years.			
<input type="checkbox"/> Yes	<input type="checkbox"/> No opinion	<input type="checkbox"/> No	
When I cultivate paddy, I use			
<input type="checkbox"/> Machine power only	<input type="checkbox"/> Man/animal power only	<input type="checkbox"/> Both of them	
When I thresh the paddy, I use			
<input type="checkbox"/> Machine power only	<input type="checkbox"/> Man/animal power only	<input type="checkbox"/> Both of them	

Technologies I used for paddy cultivation is					
<input type="checkbox"/> New technologies	<input type="checkbox"/> Modified traditional ways	<input type="checkbox"/> Traditional ways			
Technologies what I used is rolling back.					
<input type="checkbox"/> Strongly agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No opinion	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly disagree	
I have been transferred the technologies from					
In current year	<input type="checkbox"/> Government	<input type="checkbox"/> Private company	<input type="checkbox"/> Friends/ Relatives	<input type="checkbox"/> Others	<input type="checkbox"/> No technology transferred
In last 3 years	<input type="checkbox"/> Government	<input type="checkbox"/> Private company	<input type="checkbox"/> Friends/ Relatives	<input type="checkbox"/> Others	<input type="checkbox"/> No technology transferred
Technologies I have been transferred is					
<input type="checkbox"/> Very useful	<input type="checkbox"/> Useful	<input type="checkbox"/> No opinion	<input type="checkbox"/> Inconvenience	<input type="checkbox"/> Useless	
I would like to learn better technologies for paddy cultivation					
<input type="checkbox"/> Strongly agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No opinion	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly disagree	
5. Seeds					
I am able to purchase good quality seeds in my nears.					
<input type="checkbox"/> Strongly agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No opinion	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly disagree	
If it is disagreed, it is because of					
<input type="checkbox"/> No seller		<input type="checkbox"/> Too far		<input type="checkbox"/> Not able to buy	
<input type="checkbox"/> No difference		<input type="checkbox"/> No recommendation		<input type="checkbox"/> Others	
I used to purchase seeds and inputs -					
<input type="checkbox"/> Individually		<input type="checkbox"/> Collectively		<input type="checkbox"/> Others	
6. Finance					
I took agricultural loan from -					
In current year	<input type="checkbox"/> Government	<input type="checkbox"/> Lenders	<input type="checkbox"/> Relatives	<input type="checkbox"/> Others	<input type="checkbox"/> I did not take it.
In last 3 years	<input type="checkbox"/> Government	<input type="checkbox"/> Lenders	<input type="checkbox"/> Relatives	<input type="checkbox"/> Others	<input type="checkbox"/> I did not take it.
Loan from government is					
<input type="checkbox"/> Sufficient	<input type="checkbox"/> Not bad	<input type="checkbox"/> No opinion	<input type="checkbox"/> Low	<input type="checkbox"/> Insufficient	

Interest of government loan is					
<input type="checkbox"/> Too high	<input type="checkbox"/> High	<input type="checkbox"/> No opinion	<input type="checkbox"/> Fair	<input type="checkbox"/> Low	
I could manage to pay back the loan with its interest					
<input type="checkbox"/> Strongly agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No opinion	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly disagree	
Income from paddy cultivation is enough to pay back the loan					
<input type="checkbox"/> Strongly agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No opinion	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly disagree	
If it was not enough, how do you cope it?					
<input type="checkbox"/> Borrow money from lender		<input type="checkbox"/> Borrow money from relatives		<input type="checkbox"/> Sold my other assets	
<input type="checkbox"/> Borrow money from bank		<input type="checkbox"/> Sold my farmland		<input type="checkbox"/> Others	
What are the major sources for household income?					
<input type="checkbox"/> Agriculture		<input type="checkbox"/> Remittance		<input type="checkbox"/> Trade	
<input type="checkbox"/> Livestock		<input type="checkbox"/> Children in the village		<input type="checkbox"/> Other	
7. Market access					
I had to sell my paddy as I needed money.					
In current year	<input type="checkbox"/> Strongly agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No opinion	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly disagree
In last 3 years	<input type="checkbox"/> Strongly agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No opinion	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly disagree
When I sold the paddy, the buyers were _____ in the market.					
<input type="checkbox"/> Always		<input type="checkbox"/> Sometimes		<input type="checkbox"/> Not (no buyer)	
I got the fair price when I sold the paddy.					
<input type="checkbox"/> Strongly agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No opinion	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly disagree	
Market I used to sell my paddy is					
<input type="checkbox"/> Within/Neighbour village		<input type="checkbox"/> Taungtha market	<input type="checkbox"/> Others	<input type="checkbox"/> Own consumption	
Usually, I sold my paddy -					
<input type="checkbox"/> Directly to buyers		<input type="checkbox"/> via brokers	<input type="checkbox"/> sold as rice	<input type="checkbox"/> Others	

8. Labour				
If it is compared to last 3 years, it is more difficult to get skill labour				
<input type="checkbox"/> Strongly agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No opinion	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly disagree
When the labour is needed, it is				
<input type="checkbox"/> Easy to get	<input type="checkbox"/> Fairly hard to get	<input type="checkbox"/> Very hard to get	<input type="checkbox"/> No opinion	
There was damage/loss due to lack of labour.				
<input type="checkbox"/> Strongly agree	<input type="checkbox"/> Agree	<input type="checkbox"/> No opinion	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly disagree
9. Others				
<p>What are the five major challenges you are facing now?</p> <p>(Please order by its intense)</p>				
<p>What causes do you think? (maximum 5 causes)</p>				
<p>What is your suggestion to sort them out?</p> <p>(maximum 5 points and please prioritize them)</p>				