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**AGRICULTURAL PRODUCTION IN
KAWHMU TOWNSHIP
(2010-2017)**

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YANGON UNIVERSITY OF ECONOMICS
MASTER OF ECONOMICS

AGRICULTURAL PRODUCTION IN
KAWHMU TOWNSHIP
(2010-2017)

**A thesis submitted as a partial fulfillment of the requirements for the Master of
Economics, M. Econ (Economics) Degree**

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ABSTRACT

The study of agricultural production in Kawhmu Township explores the land use, sown areas, yield per acres, production of selected major crops and describes the related agricultural policies. The main aim of this study is to analyze the conditions of agricultural crops cultivation and production of Kawhmu Township. The method of this study is descriptive method analyzing the secondary sources of data and information. Major crops Kawhmu Township are paddy, matpe (black gram), pedesein (green gram), rubber, sugarcane and betel. Among them, paddy is the most profitable cash crops for livelihood in Kawhmu Township. Growing paddy production in low-lying landscape has good opportunities of livelihood security in this region. There are no cultivation of beans and pulses in some years. Rubber is the second major crops in Kawhmu Township. And betel is the main commercial crops in this region. Farming system in Kawhmu Township is mainly traditional one. The agricultural inputs of favorable soil, abundant water resources, modernized farming machineries, chemical fertilizer, sufficient agricultural loans offer considerable opportunities for diversification to more remunerative cropping system in this region. The most important inputs such as labor and loans, it is not sufficient for agriculture sector development of Kawhmu Township. Almost all farmers in this region are not only less of capital to mechanize their farms but also technology for modernized farming systems. Also it requires high-quality yielding seeds. The solution to the problem of providing sufficient is to establish credit cooperatives in rural areas of Kawhmu Township. Furthermore, the government need to provide sufficient amount of high-quality yielding seeds and also implement education programs to farmers for the development of modernized farming systems.

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CHAPTER I

INTRODUCTION

1.1 Rationale of the Study

Myanmar is by nature and also socially and culturally, an agriculture dominated country, and agriculture sector is the back bone of its economy. In other words, the agriculture sector development can partly determine the economic development of Myanmar. As Myanmar relying on agriculture, and it has been cultivating crops, edible oil, industry crops, long term plantation centering on paddy as first priority and pluses and beans as the secondary priority item. Agriculture sector contributes 65% of GDP, 50% of total export earnings, and employs 75% of the labor force. The government laid down 12 economic policies and among them fifth objective of 12 economic policies is that the government will support the agriculture and livestock sectors to promote intensive growth, enhance food security, increase exports and boost living standards. Farmers will be given full production freedoms, while the state will support high value-added crops and livestock breeding.

Myanmar is richly endowed with agricultural resources, particularly land resources. Over 70% of the population in Myanmar reside in rural areas who engaged in agriculture and their livelihood mainly depend on agriculture. So the development in agriculture sector enhance the socio-economic development of the country, the government has designated agriculture as the main pillar of the economy, and is dedicating tremendous efforts to achieve the greater progress in this sector. It is also quite important for policymakers as well as economists to realize that the country still processes large amounts of unexploited land and water resources. It is on their basic ground that the future economic policies in general and agricultural policies in particular should be laid down for the future development. Moreover, the country also enjoys favorable climatic conditions for both tropical and subtropical agriculture.

Depending on the agricultural land-use for various crops like cereal, oilseed, pluses and industrial crops. The Ministry of Agriculture, Livestock and Irrigation has laid down the most important targets of (1) Surplus in Paddy Production, (2) Self-sufficiency in edible oil, (3) Increase production and export of pulses and industrial crops. Myanmar is organized with seven States and Seven Regions. The Seven States are Rakhine, Chin, Kachin, Kayah, Kayin, and Mon. The Seven Regions are Ayeyarwaddy, Magway,

Sagaing, Mandalay, Bago, Yangon and Tanintharyi. Among them, Kawhmu is one of the Township of Yangon Regions and it is located in South-Western Part of Yangon Region. Kawhmu Township has an area of (241.90) square miles. It exists between the Twantay Township and Kungyangon Township.

With an active efforts, the Government has been adding value to land and water resources. It is building relating dams to prevent floods, and reservoirs to irrigate crops. Nowadays, we get water resources from Toe River and Kungyangon flood gate 1,2,3,4 for paddy and other crops cultivation. Kawhmu Township has the main lands for agricultural products by year by year and also Kawhmu Township is a vast agricultural land area which specialization in rice farming. As the production paddy, beans and pulses cultivation have been little changed year by year in the region.

In Kawhmu Township, the agriculture sector contributes 32.44% in 2016-2017. Changes of cereal, oilseeds, industrial and other economic crop production have been seen year by year in this region. In this region, all of the farmers' social and economic circumstances are mainly depending on the agricultural production. So, the study of agricultural production in Kawhmu Township will be presented.

The study intends to focus on the study of production of agricultural crops in Kawhmu Township, covering the period from 2010-2017. Agriculture is the main sector of Kawhmu Township. Paddy production in this region is the most important in South-Western Part of Yangon Region and there has exportation for paddy production. Moreover, cereal crops, beans and pulses, oilseed crops and industrial crops production is critically important for economic and food security of farmers' in Kawhmu Township. Therefore, this study aim to know the development of agricultural production in Kawhmu Township.

1.2 Objective of the Study

The objective of the study is “to analyze the conditions of selected major crops cultivation and production of Kawhmu Township”.

1.3 Method of the Study

The study mainly based on descriptive method by using secondary data relying on published data and statistics, official documents, and vital information from the Ministry of Agriculture, Livestock and Irrigation, particularly, from the Department of Agriculture

Land Management and Statistics, Irrigation and Water Utilization Management Department, Agricultural Mechanization Department and Livestock, Breeding and Veterinary Department.

1.4 Scope and Limitation of the Study

The study is focused on Agricultural Production in Kawhmu Township, where various kinds of crops are cultivated in sown area. The selected major crops for this study are paddy, matpe, pedesein, rubber, sugarcane, and betel. This study covers the period from 2010-2017.

1.5 Organization of the Study

This thesis is organized into (6) chapters.

Chapter I is introduction. It mentions rationale of the study, objective of the study, scope and limitation of the study, method of the study and organization of the study.

Chapter II gives literature review. It includes the key role of agriculture, contribution of agriculture to economic development, overview of agricultural policies and institutions in Myanmar and agriculture leads to poverty reduction.

Chapter III is historical background of Kawhmu Township. It includes about historical background, location, area and size, population, climate and soil, and population of the Kawhmu Township.

Chapter IV is factors supporting the development of agriculture. This chapter is organized with the land utilization, irrigation, agricultural mechanization, agricultural loans, farm implements and draught animals.

Chapter V consists of the agricultural production of major selected crops such as paddy, matpe, pedesein, rubber, sugarcane and betel.

Chapter VI is conclusion, in which composes findings and suggestions are presented.

Chapter II

LITERATURE REVIEW

2.1 Role of Agriculture

Agriculture is the science and practice of cultivating the soil, growing and harvesting crops and rearing animals with the aim of producing food and raw material for the use of human beings. It supplies the three basic human needs –food, shelter and clothing as long as man must eat to live, agriculture will continue to be a basic human activity. Agriculture remains the main source of livelihood for the majority of the population in most developing countries and it is also the primary human occupation and is carried over the world except Polar Region. Then, agriculture provides food crops like rice and wheat, industrial raw materials like cotton and sugarcane, rubber and many other products like fruits and vegetables.

Hla Myint has defined and analyzed the open economy implication of the role of agriculture in economic development by classifying the economies into closed, open and semi-open economies. He clarified the customary approach to the role of agriculture in economic development in terms of ‘contribution’ the agriculture can make or the functions it can perform during the process of economic development, and examined it critically from the stand point of international trade theory. Hla Myint illustrated for each of the four types of contributions. For example;

(a) The agriculture sector may be said to make a contribution in the voluntary sense to the domestic food supply if a rise in agricultural productivity spontaneously lowers the free market price of food. On the other hand, it can be made to contribute to the domestic food supply by say, imposing price controls on the food sold to the workers in manufacturing sector.

(b) The agriculture sector can increase the size of the domestic market if the farmers freely decide to spend their incomes on domestically manufactured goods in preference to imports but the agriculture sector can also be made to contribute to the size of the domestic market by import restrictions, that is, by being treated as the capital market of the protected manufacturing industry.

(c) The agricultural sector can voluntarily contribute to the supply of the domestic savings if these savings flow out freely, induced by higher returns to investment in the manufacturing sector, on the other hand, saving can be squeezed out of agricultural sector by taxation or by deliberately turning the terms of trade against agricultural products.

(d) The same distinction can be applied to the agricultural sector's contribution to the foreign exchange supply.

Hla Myint pointed out the common practice of treating four contribution as another source of ambiguity on the role of agriculture in economic development. He argued that the first three contribution are based on the relations between the domestic agricultural and the domestic manufacturing sectors, defined in terms of the closed-economy model. And the fourth introduces and external trading relationship between the domestic economy and the rest of the world and brings into the open-economy settings. This seems to suggest that the hybrid model or the semi-open economy is more preferable in this context. However, as cautioned by Hla Myint a number of restrictive assumption have to be imposed to minimized the effect of foreign trade on the domestic economy; if such a semi-open economy model is constructed. He suggested that the semi-open economy is more plausible when applied to a country with a low ratio of foreign trade to total domestic product.¹

Agriculture is covering a wide array of physical, biological, technical, economic and social activities and factors that govern their relationships and impact on all related activities like production, processing, storage, transportation, distribution, and marketing, selling etc. There are also many alternative development path or strategies. The resource endowments and stage of development of a country influenced the policies and strategies adopted by that country. Depending on the existing resource endowments and stage of development, the optimal development path can vary from country to country. In addition, rapid growth or stagnation of the economy in the long term would depend on choice of the paths or strategies.²

The theory states that in the early stage of development process, the majority of population is employed in agriculture and the sector provides the high percentage of national income as development proceed, both population of the country and per capita income of the people grow, there by demanding more food. If income continue to

¹ Hla Myint (1975), op. cit., p.327-28

² Hla Myint (1975), op. cit., p.333-34

increase, the demand for non-food commodities will grow as well. In expanding the non-agricultural sector, the agricultural sector provides food, labor, and capital for that sector and creates markets for the non-agricultural goods. All of these are taking place in a closed economy context but no agriculture today remains 'closed' or can remain close under the wave of globalization on the one hand and no under developed country would like to remain underdeveloped on the other hand.

All countries are trying to increase agricultural productivity and enter into international trade with some reservations in regard with free and openness of the trade. Agriculture can be improved to facilitate its role in providing food and contributing to overall development. Most increase in agricultural production will have to come from more intensive use of land which will require improved technologies generated through research as well as improved irrigation, systems, roads, market infrastructure and other investments. It will also require education and changes in institution such as land tenure systems, input and credit policies and pricing policies. Improvement in information is also crucial in promoting the role of agriculture. As development begins to proceed and economies become more complex, more information and modern information system are required for the farmers to be able to take advantage to further their own welfare and overall agricultural and economic development.

2.2 Contribution of Agriculture to Economic Development

Increased agricultural productivity and output contribute to economic development of a country in several ways;

- (a) By providing food and raw materials to non-agricultural sectors of the economy
- (b) 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,
- (c) By providing investable surplus in the forms of savings and taxes to be invested in the non-agricultural sector.
- (d) By earning valuable foreign exchange through the export of agricultural products.
- (e) Providing employment to a vast army of uneducated, backward and unskilled labor. 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.

Professor Kunzents who received the Nobel Prize in Economics in 1971, classified and discussed these contributions in two categories as the market contributions and factor contribution. In this study, the agricultural contributions to national developments are classified into three types;

- (1) Product Contribution
- (2) Market Contribution
- (3) Factor Contribution

If agriculture itself grow, it makes a product contribution, if trades with others, it renders a market contribution and the last is that if it transfers resources to other sectors, these resources being productive factor and it makes a factor contribution.

(1) Product Contribution

In this traditional interpretation, the development process is viewed as one of structural transformation from an economy in which agricultural employment and output dominate to a decline in the share of the labor force in agriculture and a decrease in the share of the agricultural product or output in GNP. The Lewis Two sector model, we saw that if food supplies to the modern sector to do not keep up with the modern sectors' demand for labor, the modern sector will have to consume a larger share of its output in feeding its labor force, and this will leave the smaller surplus for capital accumulation. More generally, it is widely believed that both in concept and in practice it is possible for the agricultural sector to make large net transfer of resource to other sector. If these transfers are used productivity, the rate of economic growth can be accelerated.

Agriculture's contribution of foodstuffs, the wage good is important because a growing urban labor force must be supported by an expanding supply of foodstuffs. John and Mellor (1961), a given rate of increase in per capita income has a considerably stronger impact on the demand for agricultural product in low-income countries than in the economically advanced countries because not only are there high rates of population growth in the LDCs, but the income elasticity of demand for food in these countries is considerably higher than in high-income countries.

(a) Food and Fiber

Growing population, rising incomes that accompany economic development and a high proportion of income increases spent on food and fiber or wage food because of wage labor spends such a high proportion of its income on food that food prices have a major impact on real wages, make increased food and fiber production a key contribution of agriculture to economic development. If food production fails to keep pace with a demand in the early stages of development, food prices tend to rise, nominal wage rate are forced up, profits and investment decline, and growth and employment stagnate.

Rising food prices can be a major cause of inflation in low income countries where typically over half of the total consumption expenditures are for food. Food imports can relieve these price pressures, but limited foreign exchange may constrain that option. Therefore food production for domestic market is one of the primary contributions to overall economic development.

(2) Market Contribution

A given sector makes a contribution to an economy when it provides opportunities for other sector to emerge or for the economy as a whole to participate in international trade and other international economic flows. And also agriculture makes a market contribution to economic growth by (1) purchasing some production items from other sector at home or abroad (2) selling some of its products not only to pay for the purchases listed under (3) but also to purchase consumer goods from other sectors or from abroad or to dispose of the product in any way other than consumption within the sector.³

(a) Foreign Exchange

Foreign exchange is needed for the import of key raw materials and capital goods. Also, with the collapse in borrowing from foreign private creditors during the 1980s, many less developed countries have been forced to generate trade surpluses to pay off external debts. The agricultural sector is often called upon to make significant contributions to these foreign exchange needs.

Many LDCs have relied on exports of agricultural commodities as their major source of foreign exchange. Others have attempted to reduce their foreign needs by increasing agricultural production to displace imports of food. Import displacement that

³John W. Mellor. *The New Economics of Growth* (Ithaca, N. Y: Cornell University Press, 1976)

occurs without protectionist policies can be viable strategy particularly for countries with rapidly expanding domestic demand for food. However, if that displacement occurs as a result of overvalued exchange rates or other trade restrictions, development may be slowed.

There are gains from specializing in particular agricultural commodities for export but those these are dangers as well, such as cyclical price fluctuations and rising protectionism in international markets.

(b) Market Demand

Economists of scale in the production of industrial products often mean that large market demand is needed. As income rise in agriculture, the potential is created for a substantial expansion of domestic demand for consumer goods and agricultural inputs;

Even though agriculture requires few inputs from industry, the consumption demand generated by growing agricultural productivity provides markets for non-agricultural sector. A study of the linkages between the agriculture and the demand for goods in India showed that each dollar of agricultural income create value-added in the non-farm economy. Agricultural development to potential for rapid growth in domestic demand labor intensive government services.

(3) Factor contribution

The factor contribution occurs when there is a transfer or loans of resources from the given sector to others. Through the transfer of capital and labor to non-farm activities, the agriculture may also provide investable surplus. There may be a compulsory transfer from agriculture for the benefit of other sectors, ordinarily through taxation in which the burden on the agriculture is greater than the governmental services provided to agriculture. As pointed out by Kunzents, this factor contribution by agriculture was clearly quite large in the early phases of economic growth in some countries but one of the crucial problems of modern economic growth is how to extract from the product of agriculture a surplus for the financing of capital formation for industrial growth.

Another way of transferring resources from the agricultural to the non-agricultural sector by the government is turning the terms of trade against agriculture by imposing price controls on agricultural products by taxation, or by using multiple exchange rates that discriminate against agriculture. If the improvement in the terms of trade in the non-agricultural sectors rises non-agricultural incomes and the beneficiaries save at a higher

agricultural sectors rises non-agricultural incomes and the beneficiaries save at a higher marginal rate than the decreased agricultural incomes, aggregate saving rates will have made a net contribution to total savings in an indirect manner.

(a) Labor

Transfers of surplus labor from agriculture to industry can provide a source of economic growth. There is a little question that the large amount of labor for industrial development must be drawn from the agricultural sector in the early stages of development. Obtaining that labor is seldom a problem if productivity increases occur in agriculture. A balanced path of development requires that the surplus must be absorbed in a productive capacity by industries. Thus, capital formation in the industrial sector should be channeled into labor-intensive industries to promote employment growth. Ensuring that capital accumulation occurs in labor-intensive industries so as to generate employment sometimes a problem.

Historically, many countries have chosen a development path that favors investment in capital intensive heavy industries. They do so for several reasons, including several prestige, which is thought to be enhanced by heavy industrial production, and innate capital bias associated with import-substitution policies. These countries often are disappointed by the result of such program. Because capital-intensive industries cannot absorb sufficient labor, increased urban unemployment and stagnating demands follow.

(b) Capital

Capital requirement for economic development are enormous. Capital is needed for factories and machinery for certain types of agricultural inputs; for infrastructure such as road, schools and electric power facilities; and for urban housing. For most countries, the major source of that capital is domestic savings. Because during the early stages of development agriculture is the largest sector, domestic savings must come primarily from agriculture, except in countries with large earnings from petroleum or mineral exports.

In general, the voluntary savings in less-developed countries are insufficient to provide the amount of capital necessary for development. Low level of income, inadequate rural finance institution, and the fact that saving require current consumption to be sacrificed, all limited savings. Hence, developing countries are required to use various devices to squeeze agriculture to mobilize capital.

Countries ensure this flow of capital out of agriculture by four basic means; taxes relative decline in agricultural prices, direct capital formation within the sector and direct investment in industries by people in agriculture. Agriculture taxation has played a key role in generating capital for development in several countries.

Land taxes are fixed taxes and therefore encourage production. They are relatively easy to administer and can be made progressive. However, land taxes are direct and obvious, sometimes associated with prior colonial history, and hence difficult to institute. Often there is substantial political pressure against land taxes, especially in societies where wealth and political power are directly associated with land ownerships. Export taxes are easier to institute and administer. They have the serious deficiency of taxing marginal production and tend to be discourage production. Income taxes tend to be difficult to administer in developing countries. Labor taxes are common for public labor works projects.

A relative decline in the price of agricultural commodities compared to industrial commodities is important mean of transferring capital from agriculture to industry in many countries. This relative decline in agricultural prices helps keep food prices low, which in turn increases profits and facilitates capital investment in industry. Where this decline in terms of trade has occurred as a result of lower production costs due to technical change in agriculture, these transfers have not been particularly onerous.

Shifting the terms of trade against agriculture requires the agricultural supply curve to shift by more than demand. Lowering the terms of trade for agriculture may be difficult to achieve in the early and middle stages of development because of rapid demand shifts caused by population and income growth. However, even agricultural production increases that are smaller than demand shifts can help reduce, the relative rise in agricultural prices and dampen upward pressure on wages and downward pressure on capital formulation.

The third means relates both of local infrastructure development and to creating agricultural linkages to input and processing markets. By stimulating this internal investment, more capital funds are made available to the industrial sector.

The fourth means of securing capital from agriculture, direct investment by agriculture in industry, has been important in those countries with effective rural institutions. As rural income grows, so do rural savings.

(c) Rural Welfare

Agricultural development can have significant direct impacts on rural development. If productivity is increased, farmers receive benefits both through in home consumption and through the income generated from farm productivity.

If agricultural development programs include asset redistribution countries where asset ownership is highly skewed, poverty reductions can be reasons in additions to those associated with sectoral growth. Finally, cultural growth stimulates nonfarm growth and employment, landless labor benefit from those employment opportunities. Farm income is largely spent on domestically produced goods, some of which are produced in rural cottage industries. In the long-run, many of farmers will also receive incomes from nonfarm employment.

Although the very early stages of development agriculture is not the only productive sector in rural areas, it is certainly the dominant sector. Even in developed countries, where agriculture's share of total rural economic activity is relatively small, rural welfare is closely linked to the fate of agriculture. In less developed countries, a stagnant agriculture can lead to increased rural poverty, accelerated migration from rural to urban areas, and extreme cases, famine. Thus, for such a large portion of the population is found in rural areas, the rural welfare contribution of agriculture is vital to national welfare.

2.3 Agriculture Policies in Myanmar Economy

In spite of the good intensions of these agricultural reforms, state intervention in the production and marketing of the some major crops still exist on a large scale. The government realizing that it is too for the agriculture sector to be lift expire in the hands of the private sector, has its own economic objectives. These include

1. To practice a policy that aims at national reconciliation, and facilitates the emergence of democratic federal union.
2. To create the economic conditions that enabled balanced development among regions and state.
3. To participate an economic policy that can create opportunities for the emergence of younger generations who are well-rounded and capable for the state.

4. To establish the economic system that allows all citizens to participate and that can achieve and maintain positive improvement results through innovation and hard work.

The economic objectives clearly reveal that the whole economy is based upon the agricultural development, and the agriculture is the bases for the development of all economic sectors. In the some lines or directions, the Ministry of Agriculture has its own basic objectives. These are

1. To achieve surplus paddy production
2. To achieve self-sufficiency in edible oil
3. To step up cultivation and export of pulses and industrial crops

These objectives clearly states that the overall agricultural development simply relies upon rice, groundnut, sesame, pulses and industrial crops like cotton and sugarcane. Although the government has a self- sufficiency drive for groundnut and sesamum, it intends to step-up on export drive for rice, pulses as well as cotton and sugarcane. Although this line of development, the Ministry of Agriculture laid down the certain principles that must be followed to enhance agricultural development. These include

1. The development of new agricultural lands
2. The provision of adequate irrigation water
3. The provision and support for increased agricultural mechanization
4. The acceleration of technological transfer
5. The development and utilization of high yielding quality seeds.

With the five principles in mind, the Ministry of Agriculture laid down a policy to encourage the expansion of agricultural area. In 1991, the government formed the Central Committee for the management of cultivable land, fallow land and waste land. The said Committee granted about (80,000) acres of agricultural land to the private sector for agricultural purpose, livestock breeding and rice-fish farming. Individual peasant farmers were given incentives and support to be engaged in rice-fish farming, which was then a new introduction in the new area of agricultural production.

From 1988 to the present day, the government constructed a total number of (241) irrigation dams and projects in line with the principles to provide adequate water supply. With all these concerted efforts, the irrigation ratio which had remained constant at about (12.5%) of net sown area in 1988 consequently increase to (16.9%). By the year 2006, nearly one quarter of agricultural lands were irrigated. More than three quarter of the total irrigated area is sown to rice, but vegetable, pulses and sesame are grown under irrigation.

In terms of agricultural policy, there is no official document specifically addressing agricultural policy, although there have been periodic policy pronouncements and statements of objectives as already been mentioned.

2.3.1 Current Landscape of agricultural sector in Myanmar

Myanmar is an agricultural country. The agricultural sector plays an important role for the economy of Myanmar and is closely linked to other socio-economic sector of the country. And also rural development is the priority in Myanmar's development policy. As the agriculture sector is developing, the socio-economic conditions of Myanmar are also improving. About 70% of the population in Myanmar resides in rural area and the agriculture is their ways of livelihood. While agriculture sector contributes 30% of national GDP, both the benefits that are gained from farming as well as the socio economic status of farmers are extremely low.

The farmer's socio-economics status has been further adversely affected by the phenomena of the climate change, and natural and manmade disasters. In particular the unpredictable weather changes that have taken place almost on annual basis in the aftermath of Cyclone Nargis in 2008 led to tremendous damage and losses in agriculture sector. At the same time, the failure to take effective actions on existing forest and soil conservation measures had exacerbated soil quality and fertility deterioration. As a consequence, most farmers have not been able to break out the vicious cycle due to low productivity, low income and indebtedness which can lead to landless. In order to uplift the socio-economics condition of farmers and improve the performance of agriculture sector, the Ministry of Agriculture, Livestock and Irrigation (MOALI) has made it a priority to support the development of the national economy through effective implementation of a fresh portfolio of concrete policies and the strategic thrusts.

The aim of these new policies and strategic thrusts, referred to as Agriculture Policy 2016 is to produce a greater and more diversified range of high quality, agricultural, livestock, and fishery products. A major intention of Agriculture Policy 2016 is to take advantages of the prevailing favorable conditions in the agriculture sector to satisfy the fast increasing the needs of local as well as external consumers. The Policy intends to create an enabling environment for agriculture, livestock and fishery sub-sectors expand and to synergize and improve each other's performance.

2.3.2 Government Agricultural Policy

During the socialist rule (1962-1988) the government economic policy was one of self-sufficiency and isolation. The import substitution policy designed for this purpose consisted of subsidized fertilizer and credit, marketing arrangement and the banning of competitive imports. By large, economic policies are characterized by a comprehensive system of trade and rigid controls on foreign exchange. After 1988, with the introduction of market-oriented economic policies, various controls measures of the preceding period were abandoned. Farmers are now allowed freedom of choice in agricultural production and participation of the private sector is encouraged in commercial production of seasonal and perennial crops. Additionally, the private sector allowed to procure and distribute agrochemicals, quality seeds, farm machinery, and other inputs. The new policies also emphasized the needs for incentives packages to encourage private sector participation in agriculture.

As a part of the 1988 reformed programmed, the Government recognized food security as key element of agricultural policy in Myanmar. Objectives developed for the agricultural sector focused on two main areas; (1) commercialization of agriculture, (2) maintaining food security. Subsequently, the MOAI emphasized food security and prosperity for farming communities through enhanced community through enhanced productivity and export promotion. Recent economic policy frameworks issued by the Government of Myanmar also identified self-sufficiency in food production and food security as a key economic objective. Nowadays, government set up the following policies to enhance agricultural production and sector.

1. To extend the production and utilization of good quality and high yielding seeds appropriate with respective local conditions.
2. To disseminate modern agricultural technology to farmers.
3. To upgrade vocational agricultural education and to spawn mid-level agriculture technicians annually.
4. To enhance research and development activities for sustainable agricultural development to promote the agriculture productivity without harming environment.
5. To encourage transformation to mechanized farming, development of climate smart agriculture, and extension of agricultural water availability to increase agricultural productivity.

6. To enact, amend, and withdraw agricultural laws and regulations in line with current situations.
7. To encourage the Public Private Partnership in agriculture and to set up the good environments essential for the increase of local and international investment in agricultural sector.

Myanmar's agricultural policy is to improve food and nutrition security and food safety for all the people and to enable smallholder farmers to increase their incomes through higher productivity and diversified production in response to market demand, as well as to enhance exports through and internationally competitive private agri-business sector.

These Policies will provide consumers, producers and business in the agricultural sector with a supportive legal and regulatory environment along with essential public investment, infrastructure and services as well as the mobilization of domestic and foreign investments. Specific policies to develop and utilize land, water and other natural resources in an inclusive, competitive, efficient, safe and sustainable manner can be organized into three categories; governance of land, water and other natural resources; access to inputs and technology for production and value-added processing, marketing and exports.

Policies related to agriculture sector to enhance agriculture's sector development are as follow.

1. Land use and Management Policy.
2. Water Use and Management Policy.
3. Agricultural financing Policy.
4. Agricultural Mechanization and Input Sector Policy.
5. Cooperative Societies and Cooperative System Development Policies.
6. Rural Infrastructure Development Policy.
7. Research, Development and Extension Policy.
8. Marketing and Value-added Processing and Export Policy.
9. Governance, Institutional and Human Resource Development Policy.
10. Environmental Conservation and Climate Change Resilience Policy.

Nowadays, the Ministry of Agriculture has laid down the sector's the Vision, Mission, Objectives and Policies.

The Vision of Agriculture Sector under Ministry of Agriculture, Livestock and Irrigation are

- (a) To attain food security for domestic consumption and higher nutrition value by all citizens.
- (b) To double the income of farmers and their socio-economic status.
- (c) To improve the quality and standards of agricultural products to compete in the international markets.

The Mission of Agriculture Sector under Ministry of Agriculture, Livestock and Irrigation are

- (a) Creating profitable and sustainable market for the farmers.
- (b) Developing seed industry to utilize high quality seeds appropriate with local conditions to compete in international market.
- (c) Adoption of Agricultural Practices.
- (d) Application of Agricultural inputs such as irrigation water, chemical and natural fertilizers efficiently and timely.
- (e) Encouraging agro-based industry to produce agricultural value-added products.
- (f) Reduction of transactional costs along the process from seeding to marketing.

The Ministry of Agriculture, Livestock and Irrigation set up the following objectives policies for agricultural sector development. The objectives are

- (1) To ensure food and nutrition security and food safety.
- (2) To safeguard the rights of the farmers and to enhance their welfare and livelihood.
- (3) To advance and upgrade the agricultural sector by organizing farmers' associations and cooperatives inclusive of small holders and subsistence farmers with promotion of gender role.
- (4) To attain sustainable rural development and to update socio-economic conditions of rural people and farmers by improving rural infrastructure, enhancing access to markets, establishing small scale enterprises and designing participatory land use plans and management.

- (5) To seek technical assistance and mobilize the financial resources from local and international agencies in support of crops, livestock, fisheries and rural development in the agriculture sector.
- (6) To promote domestic and foreign direct investment in agriculture sector.
- (7) To promote competitiveness and value-added production of exportable agricultural commodities.
- (8) To encourage the development of agro-based industry, small scale enterprises, cottage industries, and income generation activities, including ten traditional artworks and crafts.
- (9) To improve the livelihood and income generation of the rural people through the development of agricultural cooperative enterprises and the cooperative system.
- (10) To develop effective linkages of production, trading, processing, services and consumers segments along the value chains of agricultural commodities.
- (11) To improve coordination mechanism of inter- governmental agencies, to foster public- private partnership and to establish collaboration and connectivity among all stakeholders including public agencies, academia, farmer's associations, civil societies, and private sector with a view to enhancing rural development and reducing poverty.

2.3.3 Policy Reforms in Agriculture Sector

Based on the state's objective, "Sustaining agriculture development towards industrialization and all round development", agricultural policy changes were made aiming to poverty reduction and rural development through development of agriculture. Five reform measures for agricultural development urged by the President during his field visits in agricultural farms are as follows:-

- (1) Participation of farmers with enthusiasm for the development;
- (2) Replacing the traditional varieties with improved quality and high yielding seeds;
- (3) Replacing traditional farming system with modern scientific farming system;
- (4) Transforming the rain-fed farming into systematic irrigated farming;
- (5) Converting conventional small-scale farms into mechanized farms in the form of acre- or hectare-pots in order to change manual farming to mechanized farming.

Major tasks of the Ministry of Agriculture and Irrigation are seed production, training and education and research and development. Agricultural policies adopted for First Five Year Short Term Plan are:-

- (1) To emphasize production and utilization of high yielding and good quality seeds
- (2) To conduct training and education activities for farmers and extension staff to provide advanced agricultural techniques
- (3) To implement research and development activities for sustainable agricultural development
- (4) To encourage transformation from conventional to mechanized agriculture, production of crops appropriated with climate and extension of irrigated area
- (5) To amend existing agricultural laws and regulations in line with current situation.

2.4 AGRICULTURE LEADS TO POVERTY REDUCTION

The importance of agriculture and agricultural development does not stem solely from the direct contribution of the sector to national output and employment. A critical role of the sector is related to poverty reduction. There are three channels by which the agriculture sector and agricultural development contribute to poverty reduction in a country:

The first channel is the most direct and obvious. A number of ASEAN member countries still have significant incidence of poverty. The population of Myanmar, rural. Rural households are preponderantly dependent on agriculture for income, with household members working as farmers, fishermen, or as workers in farms, fishing grounds, or aquaculture ponds/pens. Thus, the first channel of agriculture development to poverty reduction is by increasing the incomes of rural households from farming activities and /or by having household members employed as farm workers as a result of the increase in agricultural production and increase in agricultural terms of trade) for domestic consumption and for exports.

The second channel of agricultural development to poverty reduction is more indirect than the first but it is also a very critical one. It involves the movement of labor (or an increase in the labor time spent) from the agriculture sector to the nonagricultural

sector. The average productivity of labor (measured as value added as a ratio of labor employed) is usually significantly higher in manufacturing and other nonagricultural sectors than in agriculture. Other things being equal, this means that the average labor income in the nonagricultural sector is higher than in the agricultural sector.

They can raise their household income and move out of poverty by having the farmer household head work part-time in the nonagricultural sector. One of the lasting sources of poverty reduction in the rural sector in East Asia is by increasing the share of nonagricultural sources of income in the total income of the households, either through part-time work or through the employment of the members of the household outside of agriculture.

The second channel is feasible if there is an increase in agricultural productivity at the same time that there is an increase in demand for labor in the nonagricultural sector. Thus, higher-agricultural productivity and faster growth in the nonagricultural sector are the foundations for the successful development of the second channel for poverty reduction through agricultural development.

The third channel is also an important, though not always necessary, channel for poverty reduction in the region. Specifically, the agricultural sector is not only a source of products and labor for an economy, it is also the source of critical "wage goods," mainly food. Other things being equal, an increase in food prices would tend to increase the pressure for higher wages by workers in both the agricultural and nonagricultural sectors. Assuming that there is no corresponding increase in labor productivity, high wages would reduce the international competitiveness of a country in the more labor-intensive industries.

Thus, for countries with large agricultural productivity is need not only to release labor to the nonagricultural sector but also to make the real price of wage goods.(i.e., key food items) relatively stable in order to allow the profitable absorption of more workers by the nonagricultural sector. Clearly, this calls for a significant rise in agricultural productivity.

Chapter III

PROFILE OF KAWHMU TOWNSHIP

3.1 Historical Background of Kawhmu Township

The name of Kawhmu is actually a Mon term in which “Kaw” means “Land” “Hmu” implies the “edge of Land”. Geographical features of Kawhmu does really match its name as the east part of the town is full of Laterite (Gawon stones) and western part of the town is more of low lying land.

It is learnt that the local history describes that Kawhmu existed even before the ages of Buddha and was integral to marine routes and flow of goods and commodities. Kawhmu can be considered as a place of religious importance as it houses five of nine hair relics of Buddha which exists across Kawhmu, Kungyangon and Twantway Townships.

In the past, Kawhmu was known as a small village which was part of Kungyangon Township, Hantharwadi District. In the year 1948, after the country gained independence from British Colony, it was regarded was a small district in the northern part of Kungyangon Township. In 1964, the era of Revolutionary Council Government, in accordance with 1907 Civilization Act Penal Code 4, Ministry of Home Affairs and Religious Affairs started to register Kawhmu as a small township. At that time, Kawhmu Township included 62 groups of residential areas _7 of which were main wards in Kawhmu and 55 were groups of villages that located around Kawhmu. In 1972, change in updated administration system saw Kawhmu Township being placed in the region of Yangon Division rather than the part of original Hantharwadi District, Bago Divison. Nowadays, Kawhmu Township locates between Twantay Township and Kungyangon Township.

Before 2012, maritime transportation was the only mean of transportation for local people if they were to travel from village to another. In the aftermath of 2012, by election, more roads in the east and west part of Kawhmu, schools, hospitals, rural healthcare centers, bridges were developed by the government to facilitate regional transportation and prosperity.

3.2 Location, Area and Size

Kawhmu Township is located on the way between Dala- Kungyangon, in the Southwestern of Yangon District, Yangon Region. It is situated between East longitude 95° 45' 15" and between the North Longitude 16° 24' and 16° 38'. It is not only 241.90 square miles but also 154301 acres wide. And it is also exist 22 feet above the water surface. The Kawhmu Township consists of 53 village tracts and 129 villages. The township is bounded by Yangon River and other side Kyauk Tan Township in the east, Toe River and other side De Da Ye and Ma-ubin township in the west, Kungyangon Township in the south and Dala and Twantay Township in the north.

3.3 Climate and Soil

3.3.1 Climate

Kawhmu Township is located in South-Western of Yangon. The weather of Kawhmu Township is warm and wet. This Township receives monsoon for four months from June to September and also receives the summer paddy from December to March. The annual average rainfall is about 15.09 inches. The minimum temperature is 26 C and the maximum temperature is 34 C and the average temperature is 31 C.

3.3.2 Type of Soil and Existence of Ground Land

The type of soil in Kawhmu Township are

- (1) Loam
- (2) Clay Loam
- (3) Slit Loam

(3.1) Existence of Ground Land

Sr. no	Types of Land	Area	Percentage(%)
(1)	Net Sown Land	126743	82.13
	(a)Farm Land	89559	58.04
	(b)Dani Land	392	0.25
	(c) Historical Land	36792	23.84
(2)	Fallow Land	198	0.12
(3)	Reserved Forest Land	3777	2.45
(4)	Wild Land	199	0.13
(5)	Others Land	23392	15.16
	Total	154301	100

Source; Department of Agriculture, Kawhmu Township

3.4 Population, Race and Religion

Population sector is an important factor, which should be taken into account when studying the development of either region or a country because all development planning and data collecting strategies are based on the population. The population of Kawhmu Township is going to be represented as per the following headings.

3.4.1 Organization of the Kawhmu Township

According to the Immigration and manpower department, Kawhmu Township is comprised of seven groups of residential wards and 55 groups of villages and 129 villages. It has the total population of 119,683 and it is 241.90 square miles wide. According to the demographic, male population stands at 58,665 and female population at 60,973 to date. Most people live in villages and just 7.2% of people live in the city area. Average number of people per household in Kawhmu is 3.9 and it is relatively compared to average population per household in Myanmar. In age group of 15-64, 80.3% of those people are in workforce and 42.2% of which work in forestry and fishing industries and 21% work as a general workers. Only 2.6% of that age group are professionals.

3.4.2 Structure of Population by Race and Religion

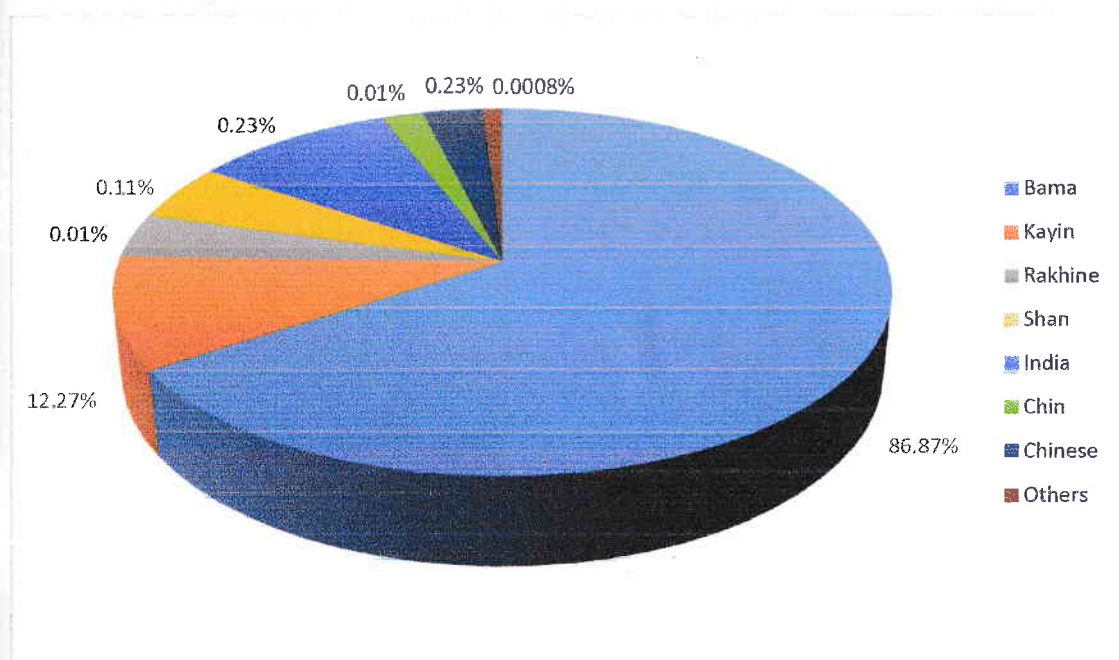
Different races live in Kawhmu Township and among them is Barma is the highest in percentage and chin is the least in percentage. Other races are Kayin, Kachin, Shan, Rakhine. Foreign immigrants such as Chinese, Indian and other reside in the township. It is shown in the table (3.1)

Table (3.2) The Structure of population by Race in Kawhmu Township (2016-2017)

Sr. No	Race	Population	Percentage
1	Bama	104084	86.87%
2	Kayin	15265	12.74%
3	Chin	8	0.01%
4	Rakhine	15	0.01%
5	Shan	130	0.11%
6	India	280	0.23%
7	Chinese	30	0.03%
8	Others	1	0.0008%
Total		119813	100%

Source; Immigration and Manpower Department, Kawhmu Township

Figure (3.1) The Structure of population by Race in Kawhmu Township (2016-2017)



Source; Immigration and Manpower Department, Kawhmu Township

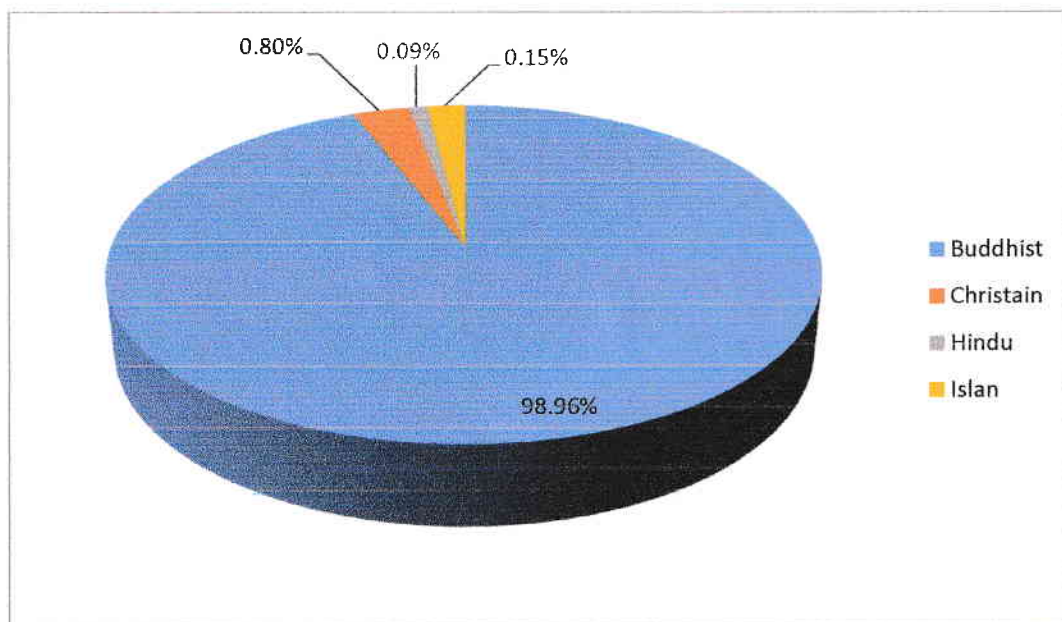
According to Table (3.2), there are Buddhist, Christians, Hindus, Islam. The number of Buddhist is more than others and the number of hindu is the least in my township. In studying the population in Kawhmu Township, there is low density of population in there. The Population density is about 495 population per square mile.

Table (3.3) The Structure of Population by Religion in Kawhmu Township (2016-17)

Sr.No	Religion	Population	Percentage
1.	Buddhist	118571	98.96%
2.	Christain	953	0.80%
3.	Hindu	110	0.09%
4.	Islam	179	0.15%
	Total	119813	100%

Source; Immigration and Manpower Department, Kawhmu Township

Figure (3.2) The Structure of Population by Religion in Kawhmu Township (2016-2017)



Source; Immigration and Manpower Department, Kawhmu Township

3.4.3 Growth of Population

Population and annual growth rates are shown in table (3.3). It is found that in 2010-2011, the growth of population is lower than other year and in 2014-2015, it is much higher than other years in Kawhmu Township. During the period from 2011-2015, the population growth in Kawhmu Township has become little higher for each year. And then, in 2015-2016, the growth of population has declined slightly and after that from 2015-2017, the population has little increased. In all years, the male population is not much different from female population.

Table (3.4) Estimated population of Kawhmu Township by Sex (2010-2016)

Year	Males	Percentage	Female	Percentage	Total
2010-11	49164	50	49971	50	99135
2011-12	61746	49	63924	51	125670
2012-13	62312	49	64631	51	126943
2013-14	62318	49	65084	51	127402
2014-15	62361	49	65147	51	127508
2015-16	58651	49	60981	51	119632
2016-17	58665	49	60973	51	119638

Source: Immigration and Manpower Department, Kawhmu Township

Chapter IV

UTILIZATION OF MAJOR AGRICULTURAL INPUTS

4.1 Land Utilization

One fourth of the total area is cultivable land in Myanmar. During the colonial period, the government undertook area expansion works aiming at more export earnings from agricultural products. The government made efforts to expand the sown areas of crops by initiating the reclamation of new agricultural land in the flooded areas, deep water areas and existing fallow, waste and virgin land area for large scale commercial farming land consolidation is also being undertaken in the existing agricultural land with proper drainage, irrigation and farm roads.

Development of agricultural land includes; (1) reclamation of fallow and cultivable waste land, (2) development of farmers' and (3) protection of soil erosion and development of terrace farming in high-land areas. Land improvements is also being undertaken in the existing agricultural land through proper drainage, irrigation and farm roads. Apart from the traditional small-scale crop cultivation, development of modernized large scale agricultural business in the private sector is also encourage. Private investors are invited and encouraged to participate in crop productions in these reclaimed areas with full coordination and cooperation of government agencies concerned. National companies and associations in the private sectors are encouraged and granted rights to develop virgin land and fallow lands for the cultivation of paddy, beans and pulses, oil crops, industrial crops, rubber, oil palm, and another crops.

For the suitability with multi- party democracy system and market-oriented economy, two land laws, namely, Agricultural Land Law and Land Management Law for Cultivable Land, Fallow Land and Waste Land, were legislated by the approval of Union Parliament in March 2012. According to these laws, existing farmers and peasant have to do official registration for the land plots on which they are currently enterprising. And after that they become to have rights to own, mortgage, heir, rent, exchange and other economic practices. In 2013, Law of protecting rights and Enhancing Economic Welfare of Farmers was enacted.

4.1.1 Land Use and Management Policy

1. All the farmers who produce crop, livestock and fish can access land in accordance with the existing Farm Land Law, and also transfer, sell, mortgage, lend, exchange, give away, or inherit their land right including tilling and other land use.
2. To capture both fresh and brackish water fishery and produce fish systematically in accordance with the Laws.
3. To establish Special Zones for the production of agriculture, livestock and fishery products so as to improve productivity.
4. Arrangement will be made available for farmers' freedom of choice to undertake any farming activities in accordance with laws (agriculture, livestock, fishery sectors) that are economically viable, in the farm land which is granted to till and use.
5. Formation of groups of farmers, including crops and livestock, and fisherman, will be encouraged and supported and aimed to work within the Land Consolidation and Land Use Management system in the transformation to a larger scale farm parcels.
6. Assistance will be provided to those who are interested in farming activities, in particular, small holder farmers and farm labors, who are landless and have extremely limited financial resources will have the rights of tilling the land that they have cleared or developed as new farm land.
7. Development of new farm land will be undertaken in accordance with the National Land Use Policy.

Now, the total land area of Kawhmu Township is approximately 154301 acres in 2017-18, and net sown area was 127003 acres. Land Utilization in Kawhmu Township can be studied in figure (4.1) during the period from 2010-11 to 2017-2018. The Land use of Kawhmu Township can mainly classified into four types and these are (1) agricultural land, (2) cultivable waste land (3) forest land and finally (4) others. Agricultural land can be classified into two types, net sown land and fallow land. Others land are such as for urban and rural reside entails religious land, cemeteries, land under water bodies (river, steam, lakes and ponds). According to the table (4.1), there are no changes in land utilization of Kawhmu Township from 2010-2015 because farmers cultivate constantly on

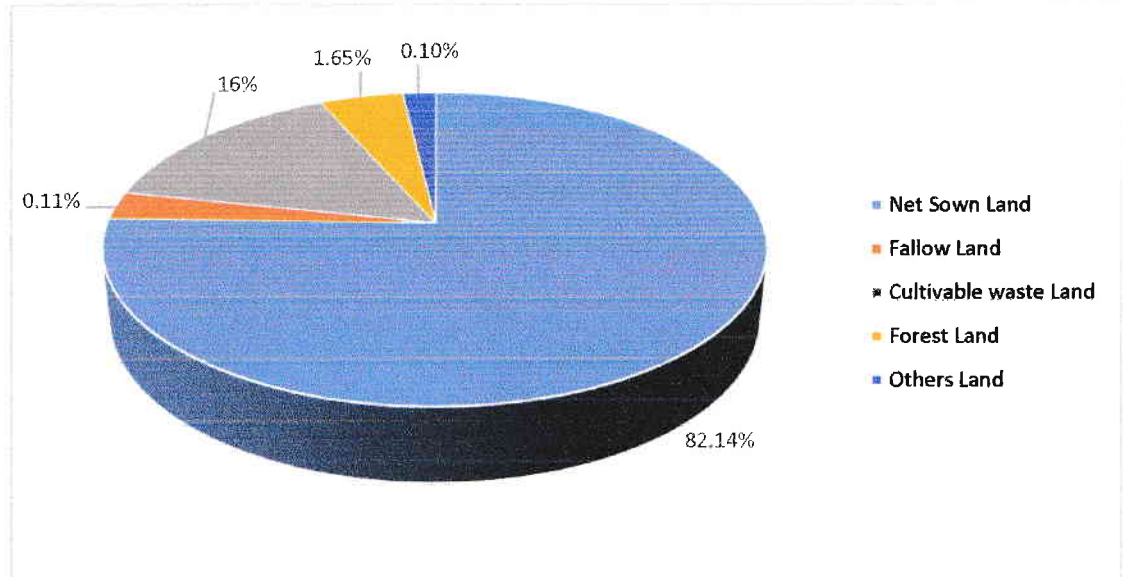
the net sown area which is the largest percentage of the total area of the township. Net sown area decreased from 126741 in 2010-11 to 125380 in 2017-18. Fallow land increased from 172 acres in 2010-11 to 1523 acres in 2016-17. This is because the farmers who cultivate rubber plants cut down these plants, so the fallow land increases and also the net sown land decreases and the cultivation of rubber decreases in this year.

Table (4.1) Land Utilization in Kawhmu Township (2010- 2011 to 2016-2017)

Year	Net Sown Land (Acre)		Fallow Land (Acre)		Cultivable Waste Land (Acre)		Forest Land (Acre)		Other Land (Acre)		Total Area of the Township (Acre)
	Area	%	Area	%	Area	%	Area	%	Area	%	
2010-11	126741	82.14	172	0.11	24678	16	2547	1.65	163	0.10	154301
2011-12	126741	82.14	172	0.11	24678	16	2547	1.65	163	0.10	154301
2012-13	126732	82.14	172	0.11	24687	16	2547	1.65	163	0.10	154301
2013-14	126732	82.14	172	0.11	24687	16	2547	1.65	163	0.10	154301
2014-15	126732	82.14	172	0.11	24687	16	2547	1.65	163	0.10	154301
2015-16	126732	82.14	172	0.11	24687	16	2537	1.58	163	0.11	154301
2016-17	125380	81.26	1523	0.99	24798	16.06	2537	1.58	163	0.11	154301

Source; Department of Agriculture Land Management and Statistics, Kawhmu Township

Figure (4.1) Land Utilization in Kawhmu Township (2016-17)



Source: Department of Agriculture Land Management and Statistics, Kawhmu Township

4.2 Irrigation

Since the days of Myanmar Kings, construction of irrigation works for crops cultivation historically has been started. After gaining independence, various irrigation projects were implemented, the Government put forward continuous efforts in the construction of dams and reservoirs throughout the country by utilizing large capital investment, manpower and machineries making the use of the available domestic resources and expertise. As the result, local irrigation facilities have been constructed in respective regions throughout the country. At present, only about 6% of the total water resources of 870 million acres feet per annum are being utilized annually. The measure for the Irrigation development are (1) Construction of new reservoirs and dams (2) Proper management for the storage and utilization of run-off water from the watershed area (3) Renovation of existing reservoirs for raising storage capacity and efficient delivery of irrigation water, (4) Diversion of water from streams and rivulets, during high water levels to into adjacent ponds or depressions for storage with sluice gate. (5) Lifting water from rivers and streams through pump irrigation and (6) Efficient utilization of ground water.

Yangon Region has much fertile rural regions. In the past, the region could not cultivate crops at its full capacity because there were no large dams in the region. So, the government had to fulfill the region needs of food sufficiency, extended cultivation of beans, pulses, industrial crops and perennial crops.

Geographically, Kawhmu Township lies between Toe River and Yangon River. Due to the nature of its low-lying landscape, production of monsoon paddy was considered marred by formation of large areas of water as there were difficulties to drain water from paddy fields. Nowadays, irrigation systems has been improved with the building of Kunyangon Reservoir, which allows water to be drained from four channels (Channel 1, 2, 3, 4). This leads to increased production of monsoon paddy and even paves way to cultivate summer paddy by effective irrigation method in summer.

There are monsoon paddy and summer paddy cultivation areas in the west of Kawhmu Township for which Toe River is the main water resources for irrigation. Moreover, in some part of the areas, there are lands where monsoon paddy production is not possible owing to accumulation of large amount of water in the rainy season. Some of these lands are used to grow Sakamayin and their numbers amount to 2302 acres. Among the cultivation of summer paddy acres in this township, cultivation of summer paddy is little amount in the west area of Kawhmu Township which is irrigated from Toe River, which can be cultivated to almost full capacity.

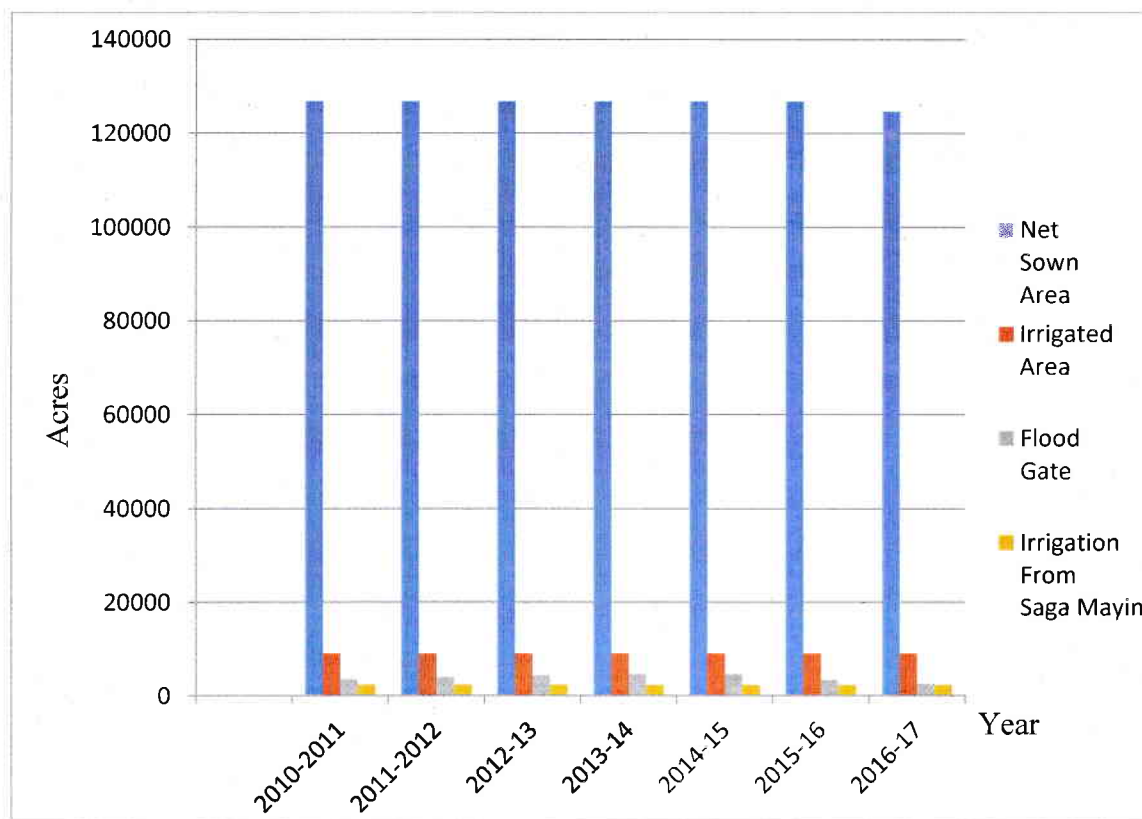
The cultivated areas of food crops such as paddy, matpe, pedesein, rubber, sugarcane, and betel and non-food crops has increased due to the rate of increase in irrigated areas varies from year to year because of in the number of dams. Table (4.2) show the irrigated areas during the period from 2010-11 to 2017-18. According to table, the water irrigation from Toe River, flood gate, irrigation for sagamyin have little changes based on the net sown area.during the period from 2010-11 to 2016-2016.

Table (4.2) Irrigated Area in Kawhmu Township (2010- 2011 to 2016- 2017)

Year	Net Sown Area (Acre)	Irrigated Area		Irrigation for Saga Mayin (Acre)	Total (Acre)	Percentage of the Irrigated Area (Acre)
		Irrigation from Toe River (Acre)	Flood Gate (Acre)			
2010-2011	126741	9050	3464	2352	14866	11.73
2011-2012	126741	9050	4001	2352	15403	12.15
2012-2013	126741	9050	4359	2352	15800	12.47
2013-2014	126732	9050	4607	2302	15959	12.59
2014-2015	126732	9050	4588	2302	15922	12.56
2015-2016	126732	9050	3400	2302	14752	11.64
2016-2017	124580	9050	2578	2302	13930	11.11

Source; Irrigation and Water Utilization Management Department, Kawhmu Township

Figure (4.2) Irrigated Area in Kawhmu Township (2010- 2011 to 2016- 2017)



Source: Irrigation and Water Utilization Management Department, Kawhmu Township

4.3 Agricultural Mechanization

Draught animals are still the main source of power in Myanmar's Agriculture. Research Activities for the utilization of farm machineries were made to reduce manpower and use of draught cattle since the colonial era. But, it was not completed successfully due to the lack of experience. After 1988, agricultural mechanization scheme was made through distribution machineries, production of farm machineries adaptable to Myanmar Agricultural land for land expansion and development in planned crop area. Under the market- oriented economic system, in addition to the state sector, private sector participation is increasing in utilization the farm machineries and equipment for various activities of agricultural production. Increased cropping intensity has expanded the use of machineries in agriculture machineries in agriculture from land preparation to harvesting and drying. Required machineries are being produced and assembled locally or imported for distribution to farmers.

The farm machinery factories under the Agriculture Mechanization Department, Ministry of Industry and many small scale private factories are producing and distributing agricultural machineries and implements. Efforts are being made to totally eliminate the traditional way of threshing paddy on the threshing floor, through the introduction of threshers and combine harvestors. Farm Mechanization save the farmers in terms of time saving, labor saving, human energy saving. Otherwise it has contributed to increase cropping intensity in the country. Because of the encouragement of government and private sector, there is an increasing trend in mechanized farming.

Land development activities for the transformation of from the conventional agriculture to mechanized agriculture are as follows. (a) Construction of farm-land roads (b) Construction of canals and drainages for irrigation purpose (c) Transforming small plots to one acre plots (d) Facilitating the purchasing process by the introducing installment system for the agricultural machineries in order to have access and affordability by farmers. So, both the private and public sector coordinated in distribution of agricultural inputs to farmers with low costs.

In Kawhmu Township, among the farm machineries, water plump is the most widely used machine and secondly, manual tractor is widely used and seeder is the least used. There is difficulties to harvest coincide in time because there is scare of workers in the farms. So, it can be found that the farmers not only buy but also hire the combined harvester to use efficiently in the modernized farming system in the following table. In

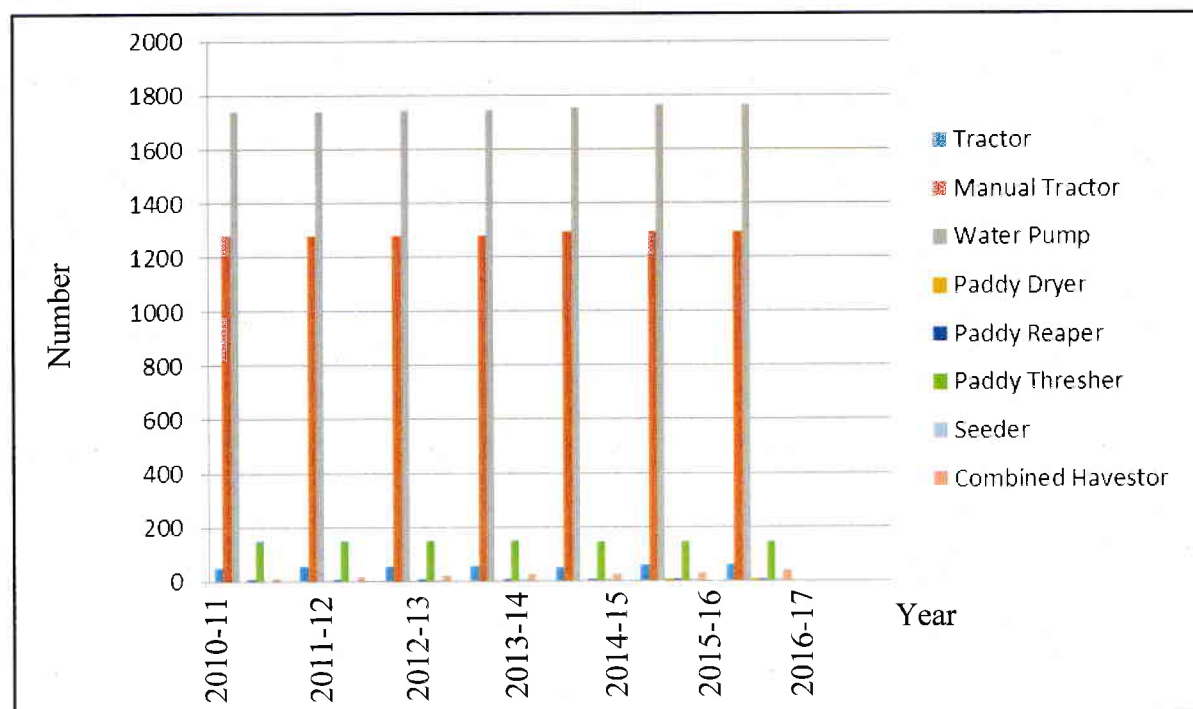
condition of various farm machineries by the farmers can be seen in table (4.3), the utilization of machine power have been increase year by year.

Table (4.3) Utilization of Machineries and Farm Implements in Kawhmu Township (2010- 2017)

Year	Machinery							
	Tractor	Manual Tractor	Water Pump	Paddy Dryer	Paddy Reaper	Paddy Thresher	Seeder	Combined Hvester
2100-11	50	1279	1740	-	2	147	-	10
2011-12	52	1279	1740	-	2	147	-	15
2012-13	52	1279	1742	-	2	147	-	20
2013-14	52	1279	1742	-	5	147	2	27
2014-15	51	1291	1752	-	5	145	2	27
2015-16	56	1293	1762	1	5	145	3	32
2016-17	56	1293	1762	1	5	145	5	40

Source; Agricultural Mechanization Department, Kawhmu Township

Figure 4.3 Utilization of Machineries and Farm Implements in Kawhmu Township (2010- 2017)



Source: Agricultural Mechanization Department, Kawhmu Township

4.4 Use of Chemical Fertilizer and Pesticides

Since the domestic supply of fertilizers and pesticides are limited, we needed the imported fertilizer and pesticides from foreign sources for my country. To increase the high yield and total production of crops, the application of chemical fertilizers are so important. Fertilizers are mainly compounds containing nitrogen, potassium, and phosphorus. In kawhmu Township, the major use of chemical fertilizers are T-Super, Potash, Urea and Compound. The most widely used fertilizer in Kawhmu Township is Urea. In the past, the farmers used T-Super and Potash so much little amount. Now, the farmers use more fertilizer proportionately and systematically year by year based on their types of land.

Table (4.4) shows the use of chemical fertilizers in Kawhmu Township during the studied period from 2010-11 to 2016-2017. The usage of T-Super, Potash, Urea and Compound increased year after year. And there are no change in the use of Potash and Compound fertilizer in 2016 and 2017 because the net sown acre remained unchanged in these years. Nowadays, farmers sometimes have to use pesticides to kill pest or insects destructive to crop.

Table (4.4) Use of Chemical Fertilizer and pesticides in Kawhmu Township (2010-11 to 2016-17)

Year	Urea (in tons)	T-Super (in tons)	Potash (in tons)	Compound (in tons)
2010-11	2017	817	550	540
2011-12	2150	1022	775	655
2012-13	2190	1635	825	810
2013-14	2201	2175	995	880
2014-15	2200	2200	1021	1100
2015-16	2200	2200	1102	1102
2016-17	2205	2205	1102	1102

Source; Department of Agriculture, Kawhmu Township

4.5 Farm Implements and Cattle

Agricultural implements and draught are also the essential part in farming operation. Farmers have to rely on draught animals for power. During the transitional Kawhmu Township, the agricultural implements and draught animals can be studied in table (4.4).

According to the table (4.4), although mechanized farming was increased in awareness, the role of buffalo and cattle were still necessary. Because of the encouragement of government and private sector, there was an increasing trend in mechanized farming. Though the public and private sectors coordinated in distribution of agricultural farmers use machineries; they still use draught animals for farming.

Table (4.5) Use of Farm Implements and Draught Animals (2016- 2017)

Sr. No	Subject	Number
1.	Normal Plough	7520
2.	Harrow	120
3.	Set-tone	5922
4.	Cart	3371
5.	Cattle	9935
	Total	26868

Source; Livestock Breeding and Veterinary Department, Kawhmu Township

4.6 Agricultural Loans

Provision of various crop loans for different cultivation season, i.e pre monsoon, monsoon and winter season are being made by the Myanmar Agricultural Development Bank (MADB). Similarly, medium and long-term loan for the procurement of draught cattle, farm implements and machineries and farm development programs available for agricultural sector development. MADB has increased step by step the amount of seasonal loans for paddy from 20,000 to 100,000 per acres during 4 years, from 2010-2014. Also Seasonal loan amount for sugarcane has been increased from 20,000 to 100,000 kyats per acres in 2012. Myanmar Agricultural Development Bank (Kawhmu Township) has credited year loan for agricultural developments. There are two types of

loans, namely, loans for rainy season and loans for winter. Loans for crops especially rice is included in rainy season.

As shown in table (4.6), loans for rainy season is greater than loan for winter season. When the borrowers (the farmers) increased the amount of loan increased. From 2010-11 to 2016-17, the amount of loan fluctuated. The Government has provided farmers the amount of 50000 agricultural loans per one acres before 2010, the amount of 100000 per one acres before 2015 and at present the amount of 150000 per acres. The government provided loans more and more year by year to develop the agricultural sector.

Table (4.6) Agricultural Loans (from 2010-11 to 2016-17)

Year	Monsoon Season Loan (kyats)	Winter Season Loan (Kyats)
2010-11	1204700000	100000000
2011-12	2580220000	200000000
2012-13	3887850000	639600000
2013-14	7182700000	782800000
2014-15	6717900000	732400000
2015-16	5969600000	721300000
2016-17	9117600000	1243200000

Source; Myanmar Agricultural Development Bank, Kawhmu Township

CHAPTER V

CROPS PRODUCTION IN KAWHMU TOWNSHIP

5.1 Types of Crops

In Kawhmu Township, many kind of crops are cultivated in sown area. All of these cultivated Paddy, Matpe, Pedesein, Sunflower, sugarcane, Rubber, Chick Pea, Chili, Onion, Garlic, Betel-leaf, Betel nut, Tapioca, Total Vegetables, Banana, Coconut, and so on. Among them the selected major crops are Paddy, Matpe, Pedesein, Rubber, Sugarcane, and Betel. The cultivated area for these types of crops are little changed during from 2010-11 to 2016-17. Sown area and growth rate of types of crops during from 2010-11 to 2016-17 are shown in figure (5.1).

To meet the objectives of domestic food security and promotion for the export, high priority to increase the production of types of crops, the Government in Myanmar has increased the sown area for the types of crops year by year.

In Kawhmu Township, the production of major crops and growth rates for each years are shown in table (5.1) and (5.2). According to table (5.2) and (5.3) the growth rates of paddy has a little changed.

Table (5.1) Production of Major Crops in Kawhmu Township (2010-11 to 2016-17)

Year	Cereals		Beans and Pulses			Oilseeds		Industrial Crops			Others
	Paddy (basket)		Matpe (black gram) (ton)	Pedesein (green gram) (ton)	Total (ton)	Sunflower (ton)	Rubber (ton)	Sugarcane (ton)	Total (ton)		
2010-2011	7091574		53	14	67	-	893398	4199	897597	1898325	
2011-2012	6990011		-	132	132	13	959367	4209	963576	1898820	
2012-2013	6690243		-	2	2	13	636914	4209	641123	1900800	
2013-2014	6893214		-	69	69	11	347811	4209	352020	1900800	
2014-2015	6956355		170	322	492	19	646821	4209	651030	1900800	
2015-2016	6914903		184	379	563	20	731111	4211	735322	1901295	
2016-2017	6749596		197	331	528	23	726182	4210	730392	1898325	

Source; Department of Agriculture, Kawhmu Township

Table (5.2) Growth Rate of Cereals, Beans, and Pulses, Industrial Crops and Betel in Kawhmu Township

Years	Total Production						Growth Rate					
	Cereals (basket)	Beans and Pulses (ton)	Oilseeds (ton)	Industrial Crops (ton)	Others (Betel) (viss)	Cereals (basket)	Beans and Pulses (ton)	Oilseeds (ton)	Industrial Crops (ton)	Others (Betel) (ton)		
2010-11	7091574	67	-	897597	1898325	0.3	100	-	23.7	17.9		
2011-12	6990011	132	13	963576	1898820	-1.5	97	13	73.5	0.02		
2012-13	6690243	2	14	641123	1900800	-4.3	-98.5	7.7	-33.5	0.14		
2013-14	6893214	69	11	352020	1900800	-3.0	33.5	-21.4	-45.1	0		
2014-15	6956355	492	19	651030	1900800	0.9	613	72.7	84.9	0		
2015-16	6914903	563	20	735322	1901295	-0.5	14.4	52.6	12.9	0.02		
2016-17	6749596	528	23	730392	1898325	-2.4	-6.2	0.15		-0.16		

Source; Department of Agriculture, Kawhmu Township

5.2 Cereals

Cereals is any grass cultivated for the edible components of its grain. Cereals grains are grown in greater quantities and area of cereal crops occupy the largest proportion of the total sown area. And these cereals provide more food energy worldwide than any other type of crops and therefore staple crops. Cereals are a rich source of vitamins, minerals, carbohydrates, fats, oils and proteins. In some developing countries, grain in the form of rice, wheat, millet or maize constitutes a majority of daily substance. In developing countries, cereal consumption is moderate and varied but substantial for many people. There are many other cereal crops cultivated in Myanmar agricultural sector. And also major crops like paddy and maize play the important role in domestic consumption while sorghum is grown for domestic animal feedstuff. Major cereal crops are paddy and maize in my country. However, paddy is the main cereals corps in Kawhmu Township, but maize is cultivated in a little amount.

5.2.1 Rice (Paddy)

Rice is the staple food in Myanmar. For Myanmar people, rice is not only a traditional and cultural product but also the most important crop because there is not yet close substitute for diet in my country. Myanmar is the world's sixth largest rice producing country. Among the Cereal Crops, such as paddy, wheat, maize and Sorghum, paddy dominates all other cereal crops in term of sown area as well as allocation of inputs and provision of services.

The total sown area in Kawhmu Township is approximately. 102143 areas in 2016-2017. In 2016-17, the total sown area of Yangon Region was 1387108. So, agricultural sown area of Kawhmu Township was 7.36% of Yangon Region. Table (5.3) shows the total sown area paddy, yield per acre and the production from 2010-11 to 2016-17.

In 2010, The Sown area for monsoon paddy was 88258 acres and the yield per acres was 66.51 in table (5.3). The sown area for summer paddy was 14866 acres and yield per acres was 82.17 basket. Total production of paddy was 6749596 tons. The sown area of monsoon paddy decreased from 88258 in 2010-11 to 88213 in 2016-17. Within the period, yield per harvested acres decreased form 66.51 basket in 2010-11 to 65.01 basket. In 2016-17. And the sown area of summer paddy also decreased from 14866 acres

in 2010-11 to 13930 in 2016-17 but yield per harvested acres increased from 82.17 baskets in 2010-11 to 85.52 baskets in 2016-17.

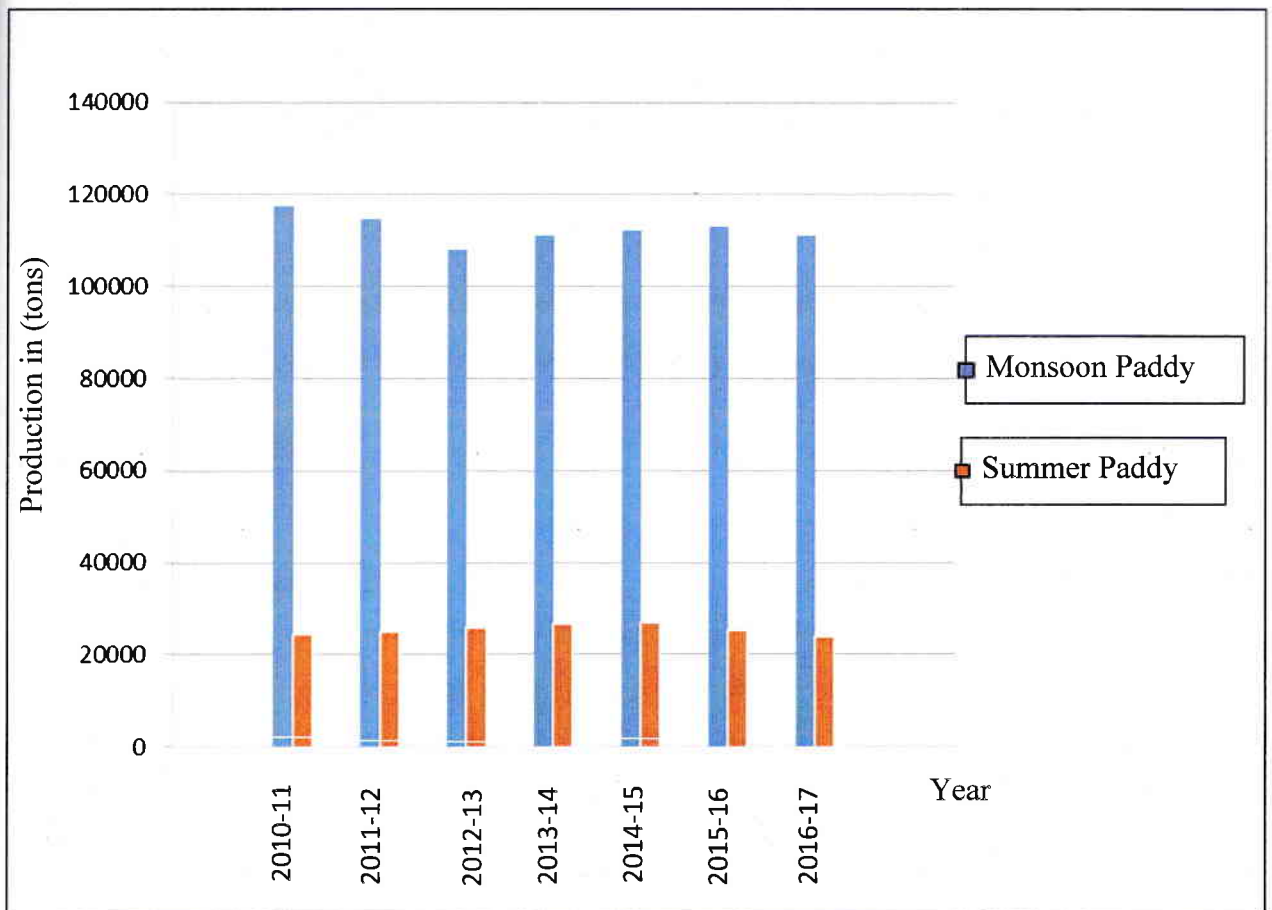
It can be studied that the sown area for both monsoon and summer paddy slightly decreases from 2010-11 to 2016-17. By decreasing the sown area and cultivated area for both types of paddy, the production has also decreased. Studying the agricultural activities of local people, it can be noted that the number of cultivated land varies every year depending on the types of fallow land. In the terms of seeds, they normally grow locally manufactured seeds which can result in the production of 60-70 acres per year. In some years, relatively low number of production could be translated to fewer numbers of local seeds were used for the cultivation. In 2015-2016, increased usage of high yield quality seeds rendered a yield of 64.09 basket per acre. The number of high yield quality seeds sown area fluctuates according to the market situation.

Table (5.3) Production of Monsoon and Summer Paddy by Kawhmu Township (2010-2011 to 2016-2017)

Year	Monsoon Paddy				Summer Paddy				Total		
	Sown Area (Acres)	Harvested (Acres)	Yield per Acre (basket)	Production in (tons)	Sown Area (Acres)	Harvested (Acres)	Yield per Acre (Basket)	Production in (tons)	Sown Area (Acres)	Harvested (Acres)	Production in (tons)
2010-11	88258	88258	66.51	117400	14866	14866	82.17	24427	103124	68.77	141827
2011-12	88197	88197	65.07	114779	15403	15403	81.22	25020	103600	67.47	139799
2012-13	87965	86309	62.57	108019	15800	15800	81.64	25759	103765	64.47	133778
2013-14	88085	88085	63.09	111144	15907	15907	83.99	26719	103992	66.29	137863
2014-15	88213	88213	63.54	112101	15922	15922	84.87	27026	104135	66.80	139127
2015-16	88228	88228	64.09	113090	14752	14752	85.44	25207	102980	67.15	138297
2016-17	88213	88213	63.01	111166	13930	13930	85.22	23825	102143	66.08	134991

Source; Department of Agriculture, Kawhmu Township

Figure (5.1) Production of Paddy in Kawhmu Township (2010- 2011 to 2016- 2017)



Source: Department of Agriculture, Kawhmu Township

5.3 Beans and Pluses

Beans are the most significant legume for human consumption since they rank as the second richest source of protein in our diet. Pulses, and include all the edible seed that grows in ponds, and include all types of peas, beans and letils. The production of beans and pulses can be traced back to the British Rule, when first seeds were brought from India along with growers to be cultivated on the rich Burmese soil and also Myanmar is a leading producer of beans & pules and exports for them to other countries is very important and can prove to be one of one highest growth areas due to the country's Locational advantage, favorable climatic conditions and fertilize soil. The growing of beans and pulses was once aimed at supplementary farm income in local communicates serving as an insurance crop in case of failure in other crops.

Even through beans and pulses are decent substitution crops to paddy, their cultivation used to be very low because they need a great amount of moisture to grow and this can create a challenging situation for farmers. Secondly, the amount of money needed to cultivate beans for oil production is also a considerable factor for farmers and the potential damages and losses brought by the insects and bacteria are among the causes of concerns.

It states that the farmers cultivate experimentally Thet- Latt seeds in good-situation places now in table (5.5). In Kawhmu Township, only two kind of beans and pulses are cultivated in sown area. These are Matpe (black gram) and Pedesein (green gram).

5.3.1 Matpe (Black Gram)

The production of matpe (black gram), one of the export crop was increased and the sown area for matpe (black gram) was also increased. Yield per area was increased because of irrigation system, use of chemical fertilizer and pesticide year by year. The sown area and production of Matpe (black gram) during from 2010-11 to 2016-17 are shown in table (5.4).

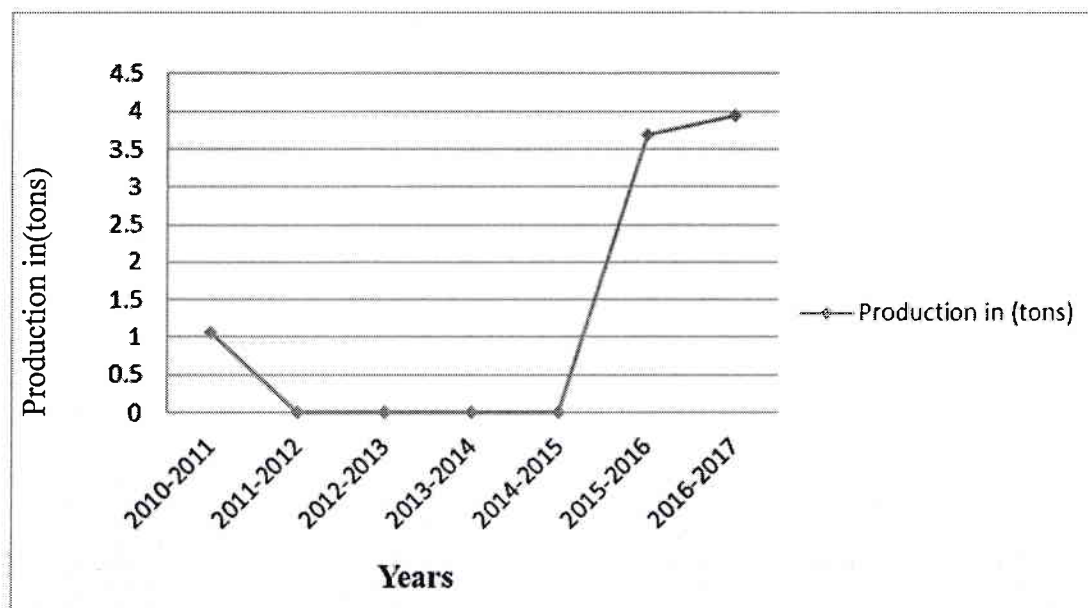
According to table (5.7), in 2016-17, the highest growth of sown area of Matpe (black gram) was 17 acres and total production was 3.94 tons. From 2014 to 2017, the sown area increases slightly and also total production increases little amount. In Kawhmu Township, Large water accumulation areas, the time to harvest locally manufactured seeds is December and January, inconsistency in the timing of beans cultivation, less profitability compared to paddy, insufficient knowledge to expertise and having small amount of capital to embrace advanced inputs are also reasons which explains lack of commercial cultivation of beans in the years 2011, 2012 and 2013. After these years, the production of matpe immediately increased because some farmers not only started to grow short-term paddy but also started to have sufficient capital and technology. To increase the cultivation acres and yield per acres, the farmers should cultivate short-term paddy and the government should provide technology and financial assistance and also the government set up the plans for all farmers in this township to cultivate beans and pulses and so the aggregate production of matpe increase in future year in Kawhmu Township.

Table (5.4) Sown Area and Production of Matpe (black gram) in Kawhmu Township (2010-11 to 2016-17)

Year	Sown Area(Acres)	Harvested (Acres)	Yield Per Acre (Basket)	Production in (tons)
2010-2011	13		4.07	1.06
2011-2012	–		–	–
2012-2013	–		–	–
2013-2014	–		–	–
2014-2015	15	15	11.33	3.40
2015-2016	16	16	11.50	3.68
2016-2017	17	17	11.58	3.94

Source; Department of Agriculture, Kawhmu Township

Figure (5.2) Production of Matpe (black gram) in Kawhmu Township (2010-11 to 2016-17)



Source; Department of Agriculture, Kawhmu Township

5.3.2 Pedesein (Green Gram)

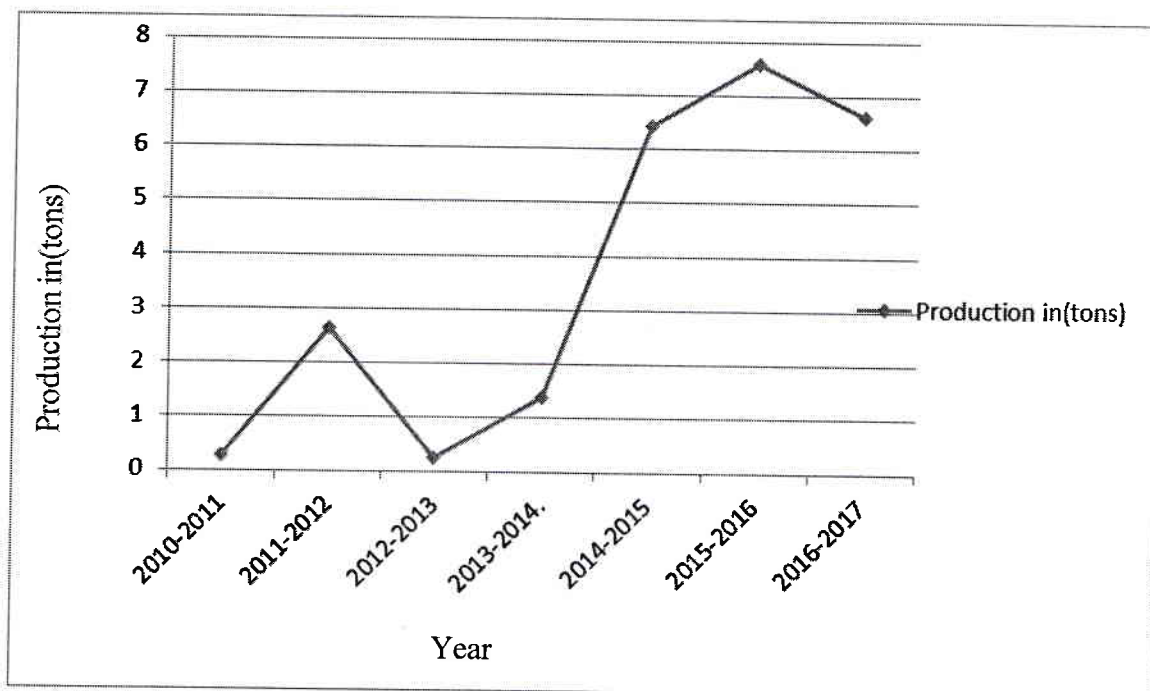
Pedesein is one of the important beans & pulses. According to table (5.5) in 2015-16, the highest growth of sown area and production were 35 acres and 7.58 tons. In 2012-2013, the lower growth of sown area and production were only 2 acres and 0.24 tons. During the period from 2010-11 to 2016-17, the sown area and production of pedesein have been increase trend. Both sown area and production of pedesein (green gram) simply depend on the quantity of seeds, fertilizer, agro chemicals, and adequate water supply. According to Table (5.5), both the sown area and production of Pedesein increases slightly year by year because since 2014, beans and legumes production has increased thanks to Agricultural Administration Department which has farmers grow beans in testing fields, disseminated necessary knowledge for beans production and provided irrigation for moisture reservation needed to cultivate beans. Table (5.5) shows the sown area and production of pedesein (green gram) in 2010-11 to 2016-17 for Kawhmu Township.

Table (5.5) Sown Area and Production of Pedesein (green gram)in Kawhmu Township (2010-2011 to 2016-2017)

Year	Sown Area (Acres)	Harvested (Acres)	Yield per Acres (Baskets)	Production in (tons)
2010-2011	3	3	4.70	0.28
2011-2012	28	28	4.73	2.64
2012-2013	2	2	7.22	0.24
2013-2014	6	6	11.56	1.38
2014-2015	30	30	10.72	6.44
2015-2016	35	35	10.83	7.58
2016-2017	40	30	11.02	6.62

Source; Department of Agriculture, Kawhmu Township

Figure (5.3) Production of Pedesein (green gram) in Kawhmu Township (2010-11 to 2016-17)



Source: Department of Agriculture, Kawhmu Township

5.4 Oilseeds

Oilseeds are leading supplier of superior quality and speciality vegetable oils to nutritional products, natural food and premium snake food worldwide. Oil producing crops are corn, oat, cotton, soybean, mustard, camelina, crambe, sunflowers, peanut and coconut, etc. Oilseeds produced in most of the countries are mostly used for oil extraction. In Myanmar Oilseeds Corps play a vital role for high consumption of cooking oil compared to other neighboring countries. There are two quality types of oils, use as a food grade oil and industrial oils which are not edible but have been bred to contain high level of compounds critical for some industrial process. As the inadequate amount of edible oil has been produced for local consumption. Several amount of tons of palm oil are being Imported annually to meet the local requirement. In Kawhmu Township, the only kind of cultivation of oilseeds crop is sunflower and it is cultivated in little amount and the production sunflower is slightly changes in year by year.

5.5 Industrial Crops

Industrial crop also called a non-food crop is a crop grown to produce goods for manufacturing for example of fiber for clothing , rather than food given to an enterprise that attempts to raise farm sector income and provide economic development activities for rural areas. Industrial crops also attempt to provide products that can be used as substitutes for imports from other nations. There are many other types of industrial crops. Such as agave, cassava, crambe, cuphea, elephant, grass, fibre, hemp, flax, rubber, sugar cane, etc. In Kawhmu Township, the major industrial crops are rubber and sugarcane.

5.5.1 Rubber

Rubber is a polymer with the property of elasticity. There are two categories of rubber: natural rubber: currently obtained from the rubber trees and synthetic rubber derived from petro chemical. Rubber is one of the most important industrial crops. Recycled rubber has become one of the significantly used. Flooring products in recent times, became it holds plentiful benefits. The most important of these benefit is protecting the earth and mutual environment around as. Some rubber products like rubber ring, rubber seal, Sealing rings, rubber washer, etc. In Kawhmu Township, Rubber is one of the alternative crop to paddy and it is also produced in large scales. There was a time when rubber plantation was very popular and it had brought large amount of foreign income as a tons of raw rubber and rubber products were exported to neighboring countries.

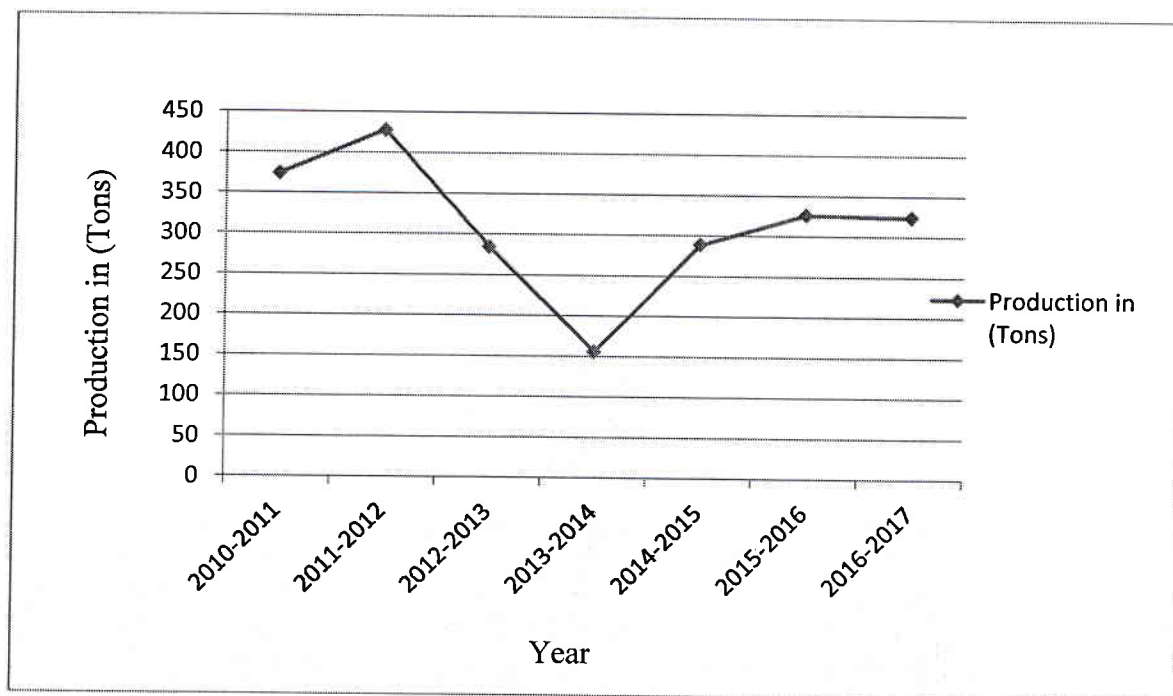
However, in the aftermath of Cyclone Nargis, rubber production and market price of rubber suffered due to poor maintenance and failure to keep up with the supply need for the rubber plantation. In 2014-2015, there were increased production of rubber which leads to the recovery of market prices of rubber and rubber products. In 2013-2014, the yield of rubber significantly fall from 284 tons to 155.28 even through the same number of acres was used. That was due to decreased efforts collect rubber juice from rubber trees and unstable market prices. In 2016-2017, the number of rubber plantation areas dipped to a considerable 2383 acres from 4188 acres and production of rubber was obviously low compared to previous year. Table (5.6) shows the sown area and production of rubber during the period from 2010-11 to 2016-17.

**Table (5.6) Sown Area and Production of Rubber in Kawhmu Township
(2010- 2011 to 2016- 2017)**

Year	Sown Area (Acres)	Harvested Acres	Yield Per Acres (Area)	Production in (Tons)
2010-2011	4071	2103	399.40	374.47
2011-2012	4188	2103	456.19	428.29
2012-2013	4188	2103	302.86	284.34
2013-2014	4188	1588	226.15	155.28
2014-2015	4188	1538	420.56	288.71
2015-2016	4188	1538	476.36	326.39
2016-2017	2838	1538	472.16	324.19

Source; Department of Agriculture, Kawhmu Township

**Figure (5.4) Production of Rubber in Kawhmu Township
(2010- 2011 to 2016- 2017)**



Source; Department of Agriculture, Kawhmu Township

5.5.2 Sugarcane

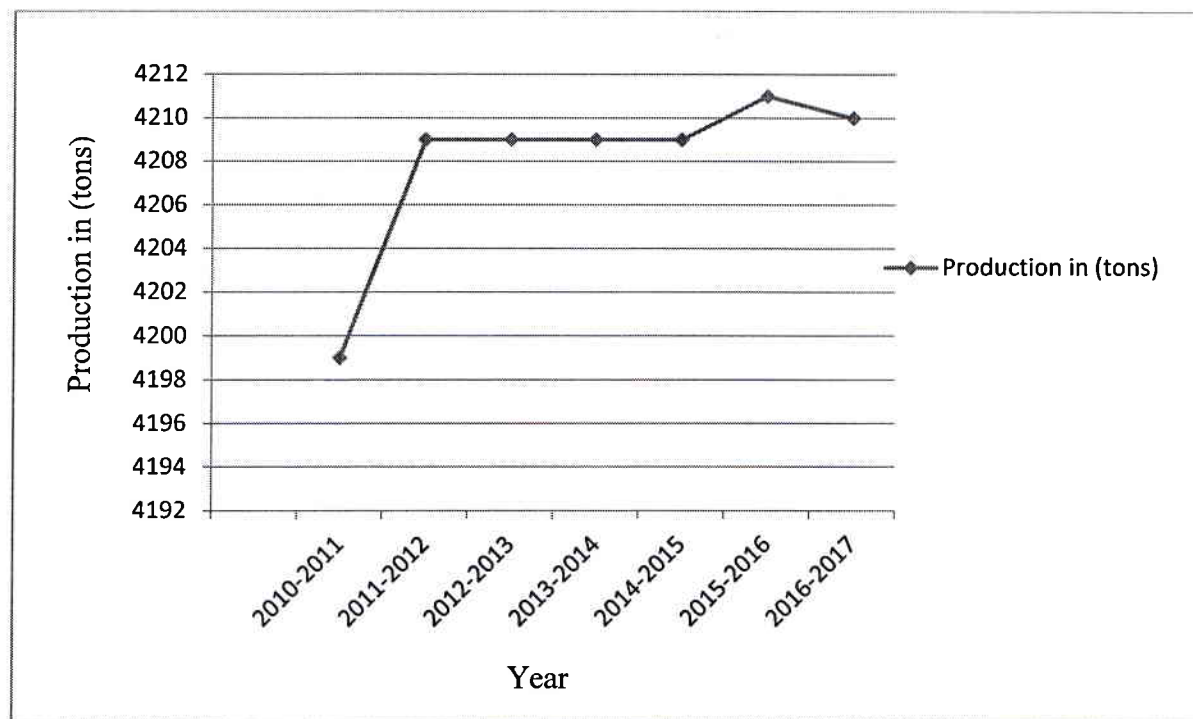
Sugarcane is a perennial tropical grass with stout joint stems from which sugar is extracted. The fibrous residue can be used as fuel, in fibreboard and for a number of other purposes. Sugarcane is also one of the most important crop among the industrial crop group. Sugarcane is needed locally both for industrial use and domestic assumption. The state has already stepped up efforts to boost sugarcane production mainly through the facilitation of the Myanmar Sugarcane Enterprise. Farmers in Kawhmu Township also cultivate sugarcane to make some extra income. Sugarcane is one of the industrial crops and people grow it for both consumption and production purpose. According to table (5.7), there are a vast number of sown acres and there is only a slight variation in the number of sugarcane acres each year. Table (5.7) shows the area and production of sugarcane in Kawhmu Township.

**Table (5.7) Sown Area and Production of Sugarcane in Kawhmu Township
(2010- 2011 to 2016- 2017)**

Year	Sown Area (Acres)	Harvested (Acres)	Yield Per Acres (tons)	Production in (tons)
2010-2011	202	202	20.79	4199
2011-2012	202	202	20.84	4209
2012-2013	202	202	20.84	4209
2013-2014	202	202	20.84	4209
2014-2015	202	202	20.84	4209
2015-2016	202	202	20.85	4211
2016-2017	202	202	20.84	4210

Source; Department of Agriculture, Kawhmu Township

**Figure (5.5) Production of Sugarcane in Kawhmu Township
(2010- 2011 to 2016- 2017)**



Source; Department of Agriculture, Kawhmu Township

5.6 Other Crop (Betel)

People in Kawhmu Township normally making a living by growing various kinds of crops, oilseeds and industrial crops and betel. Betel leaves are widely used in in various traditionally occasions in Myanmar. They are included in many traditional medicines as important ingredients. Betel chewing is a popular habit among some Burmese in which betel leaves are mixed with betel nuts, lime and some ingredient from India. Strong market price and high demands betel means farmers all across Myanmar grow betel for commercialization.

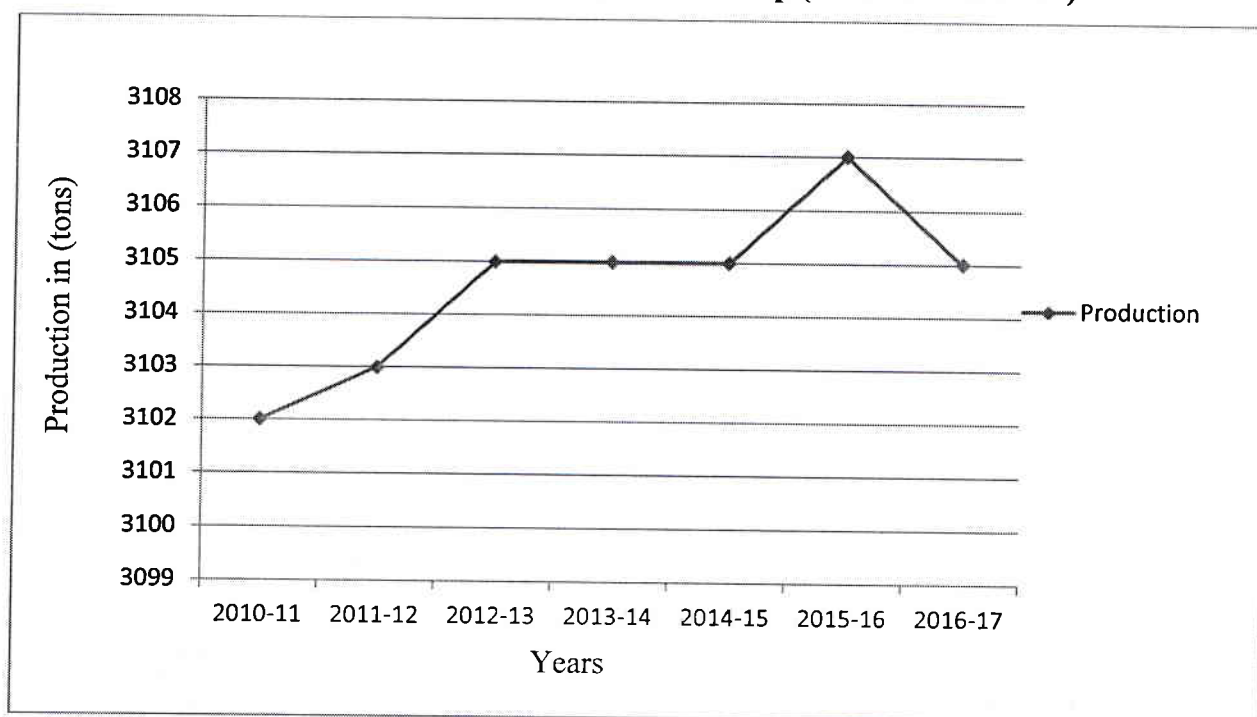
Residents of Kawhmu Township also grow betel to make extra incomes before seasonal paddy cultivation is underway. Although the sown acres and harvested acres are same from 2010- 2011 to 2015- 2016, the production of betel changed slightly in these years. In 2017, the production of betel decreased because of sweather conditions, pesticides and insufficient water. Table (5.8) suggests marginal variation in the production of betel year after year.

Table (5.8) Sown Area and Production of Betel in Kawhmu Township (2010-2011 to 2016-17)

Year	Sown Area (Acres)	Harvested (Acres)	Yield per Acre(tons)	Production (in tons)
2010-2011	495	495	3835	3102
2011-2012	495	495	3836	3103
2012-2013	495	495	3840	3105
2013-2014	495	495	3840	3105
2014-2015	495	495	3840	3105
2015-2016	495	495	3841	3107
2016-2017	495	495	3840	3105

Source; Department of Agriculture, Kawhmu Township

Figure (5.6) Production of Betel in Kawhmu Township (2010-11 to 2016-17)



Source; Department of Agriculture, Kawhmu Township

CHAPTER VI

CONCLUSION

6.1 Findings

Kawhmu Township is located in the South-Western part of Yangon Region. 42.2% population of Kawhmu Township works in agriculture, livestock and forest. So, social and economic conditions of people in this region mainly depend on agricultural products such as paddy, matpe, pedesein, rubber and betel. During the studied period from 2010-11 to 2016-17, the sown area and selected major crops were little changed year by year. In this study on the production of only to major crops in Kawhmu Township can be selected and analyzed.

Paddy is the major crop in the agricultural sector of Kawhmu Township. Rubber is the second major crop and it has the largest number of net sown acres in this region. And also betel is grown for commercial purpose. The cultivation of beans and pulses, oilseed crops, subsidiary crops are relatively low after monsoon paddy cultivation. In Kawhmu Township, the farmers cultivate the summer paddy by irrigating water from the drain which is digged for the aim less flooding in time of monsoon paddy cultivation. Therefore, the number of sown acres varies according to market price and costs and challenges of irrigation for summer paddy after cultivation of monsoon paddy.

The cropping system in Kawhmu Township is not being changed during the period from 2010- 2011 to 2016- 2017. The technology used in farming system of this region is traditional one which includes mainly direct seeding and transplanting seeding.

Monsoon paddy production in 2012-2013 was the lowest and the number of its production remains unchanged in other years. The number of summer paddy cultivation acre in 2014-2015 was the largest but the cultivation acres was lowest in 2016-2017. Nevertheless, production rate has been increasing year after year.

Pedesein was grown in a relatively small area in 2013-2014 and there were more test cultivation acres of Pedesein in 2014-2015 but there were no significant changes in their yearly production. There was lack of Matpe cultivation until 2013-2014 and Matpe was started to grow in 2014-2015 and their production rate remained unchanged from 2014- 2017. All these types of beans and pulses are grown using moisture remained after monsoon paddy cultivation. Factors contributing low cultivation of Beans and Pulses in

Kawhmu Township are unfavorable geography and market situation, cultivation of local paddy and capital deficit and detrimental natural conditions such as insects and bad weather.

Similarly, there is no oilseed production because farmers are traditionally more focused to grow paddy and other crops. Farmers in Kawhmu Township use less chemical fertilizers. In some areas, only local seeds are used and they need less chemical fertilizers due to natural soil which enrich nourishment necessary for crops to grow. Until 2010-2011, Urea was the only chemical fertilizer used in Kawhmu Township and, in later years, T-super, Potash and Compound chemical fertilizers are used proportionately. Standard methods for chemical fertilizers are used to prevent crops from getting unwanted effects from chemical fertilizers.

Normally, government sets up the policies, vision, mission and objective for the agricultural sector development, some of policy actions cannot be implemented for development of farmers. Otherwise, government loan schemes are enough to grow monsoon paddy if farmers embrace standard growing methods. But these loans are insufficient to grow summer paddy because it requires additional inputs for specific nature of soil and local weather conditions. It is noted that some farmers spend their agriculture loans on purchasing agricultural machines and tools.

Rubber is the second most popular crop and its production stood at 4188 acres in 2015-2016. Nevertheless, that number reduced to just 2838 acres and it happened because farmers chopped down a number of rubber plants that year. The scale of rubber production was lowest in 2013-2014 because farmers decided not to produce raw rubber due to low market price and increased cost of plantation.

Even though there were no changes in the net sown acres of Betel, which is the third most commercialized crop, and scale of betel production and changes of price, the amount of income generated by betel has had changes.

6.2 Suggestion

In order to enhance the agricultural sector of Kawhmu Township, it is necessary to provide essential inputs such as land levelling, irrigation, agricultural machineries and tools, modernized farming technology, quality seeds, loan schemes and other important inputs. Nonetheless, it is important for farmers to have an effective cooperation with departments under Agriculture, Livestock and Irrigation Department.

At the moment, the government is not able to distribute sufficient amount of new-high yield varieties to meet the needs of farmers. So, it is important to have more high quality seed production chains that are capable of producing and distribution of high quality seeds of modern varieties into the hands of local farmers. It is necessary to distribute high-quality seeds from other regions in cooperation with Seeds Grower Associations (SGAs) and to set up local seeds distribution companies which distribute high quality seeds from seed production companies in the agricultural sector for the prosperity and development of the region.

Insects can bring catastrophic impacts to the crops and it is crucial that government implement protective measures for crops, use insecticides systematically, provide warehouses to store insecticides and prepare action plans in the wake of natural disaster.

While implementing education programs to farmers for the development of modernized farming technology, the government need to pave for farmers associations that can serve for the sake of economic prosperity and improvement of lifestyles of farmers. Additionally, meticulous plans for agricultural crops such as; land development, soil reservation and protection, development of new cultivable lands, irrigation and refitting land suitable for modernized machineries use are also needed to develop by the government.

In terms of agricultural loan, loans provided by the government should be enough to meet the needs of farmers. Loan schemes should be so flexible and effective that farmers can take out loans regardless of the amount and time in order to grow commercial crops and oil seeds such as beans, pulses, sunflowers and groundnuts. And also government should provide needed investment for rubber, vegetables and long-term crops.

They may need government loan for land preparation, irrigation, soil protection and to purchase machineries and tools for cultivation purposes. In doing so, farmers will be able to manage more effectively to grow types of crops they desire to grow based on their budget, potential return on investment and income. Otherwise, the price of cultivated crops must be stable. So, strong and stable market price plays an important role to promote increased productivity and bring economic development for farmer families.

First and Foremost, cooperative measures of government departments, private companies and non- private organizations are required in order to increase productivity of agricultural products.

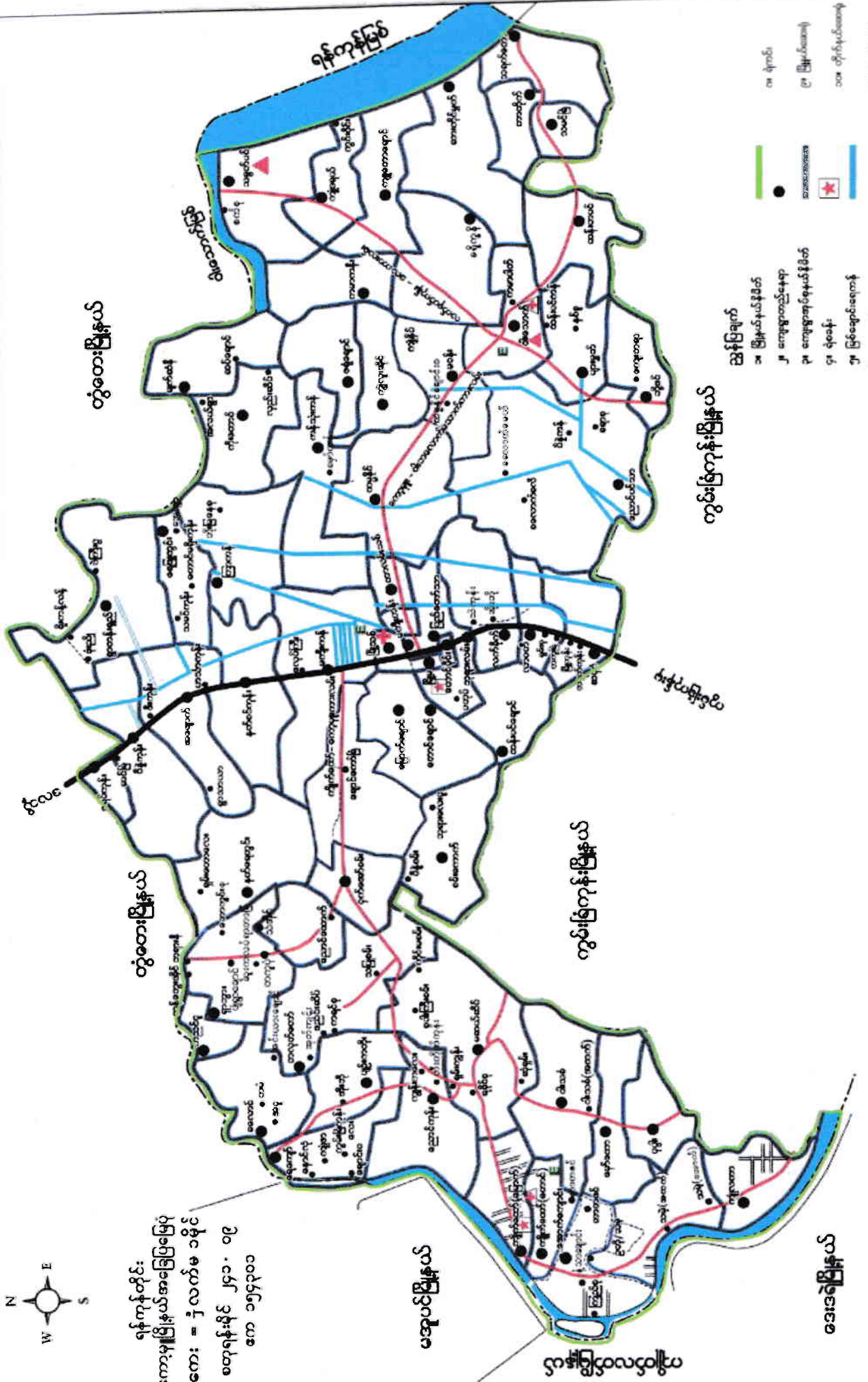
Making the most of essential inputs and systemic employment of agricultural machineries are also necessary. Owing to individuals farmers do not possess the agricultural machineries, private companies and government departments should find out ways to make sure farmers are able to possess and embrace modern farming machines and methods extensively.

Having plenty of rivers and streams in Kawhmu regions limits effective utilization of agricultural machineries from the process of cultivation to harvest of crops in farms. Therefore, more and more irrigation channels, creeks, reservoirs and bridges are requires to build to prevent flood and create a favorable environment for efficient cultivation.

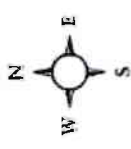
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- ညွှန်းပြချက်**
- ၁။ မြို့နယ်နယ်နိမိတ်
 - ၂။ အကျဉ်းစင်္ကြံ
 - ၃။ အကျဉ်းစင်္ကြံ
 - ၄။ လမ်း
 - ၅။ မြို့နယ်ရုံးချုပ်
 - ၆။ ကားလမ်း
 - ၇။ ကားလမ်း (အကျဉ်းစင်္ကြံ)



ရန်ကုန်တိုင်း
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အကျဉ်းစင်္ကြံ

အညောင်မြို့နယ်

ကွမ်းခြံမြို့နယ်

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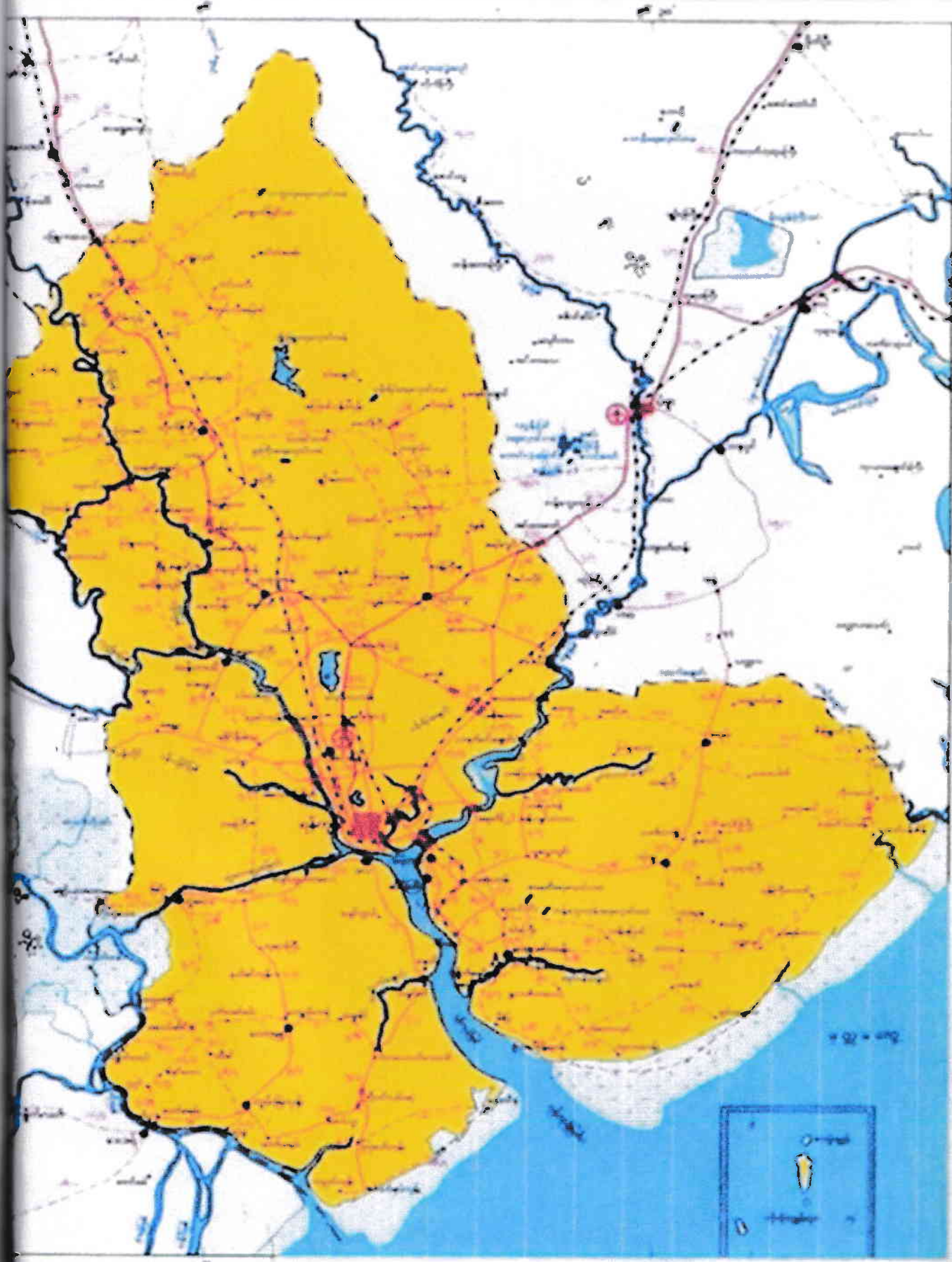
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ရန်ကုန် တိုင်း



၁။ ပြည်ပသို့ ဝင်ရောက်ရေး အထူးစီမံခန့်ခွဲရေး ဝန်ထမ်းများ (၁) (၂) (၃) (၄) (၅) (၆) (၇) (၈) (၉) (၁၀) (၁၁) (၁၂) (၁၃) (၁၄) (၁၅) (၁၆) (၁၇) (၁၈) (၁၉) (၂၀) (၂၁) (၂၂) (၂၃) (၂၄) (၂၅) (၂၆) (၂၇) (၂၈) (၂၉) (၃၀) (၃၁) (၃၂) (၃၃) (၃၄) (၃၅) (၃၆) (၃၇) (၃၈) (၃၉) (၄၀) (၄၁) (၄၂) (၄၃) (၄၄) (၄၅) (၄၆) (၄၇) (၄၈) (၄၉) (၅၀) (၅၁) (၅၂) (၅၃) (၅၄) (၅၅) (၅၆) (၅၇) (၅၈) (၅၉) (၆၀) (၆၁) (၆၂) (၆၃) (၆၄) (၆၅) (၆၆) (၆၇) (၆၈) (၆၉) (၇၀) (၇၁) (၇၂) (၇၃) (၇၄) (၇၅) (၇၆) (၇၇) (၇၈) (၇၉) (၈၀) (၈၁) (၈၂) (၈၃) (၈၄) (၈၅) (၈၆) (၈၇) (၈၈) (၈၉) (၉၀) (၉၁) (၉၂) (၉၃) (၉၄) (၉၅) (၉၆) (၉၇) (၉၈) (၉၉) (၁၀၀)