

**YANGON UNIVERSITY OF ECONOMICS**  
**MASTER OF ECONOMICS**

**AGRICULTURAL PRODUCTION IN TAIKKYI TOWNSHIP**  
**(2002-2017)**

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**YANGON UNIVERSITY OF ECONOMICS**

**MASTER OF ECONOMICS**

**AGRICULTURAL PRODUCTION IN TAIKKYI TOWNSHIP**

**(2002-2017)**

A thesis submitted as a partial fulfillment of the requirements for the degree of  
Master of Economics (Economics)

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## ABSTRACT

The future economic prospects and economic development depend on the performance of the agricultural sector. The growth of a region and country are mostly supported by agricultural sector. To developed in the agricultural sector, not only the good transportation is needed but also the market for agricultural crops is required. In view of this fact, the author examines agricultural production in TaikkyiTownshipduring the year (2002-2003 to 2015-2016). It describes the land-use, sown areas, yield per acre, production of selected major crops. Rice is dominant crop and other major crops such as pulses and oilseeds are growth throughout the period year. It is found thatmost all farmers in Taikkyi Township are lack of capital to mechanize their farms. Taikkyi Township plays part of important role in Myanmar economy. Because of Taikkyi Township is a good cultivated region, the yields of all kinds of crops have good result, And then, the proper weather conditions favour the crops to grow. The government is needed to support quality of seeds, dams and macharies.

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M.Econ (Eco)

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# CHAPTER I

## INTRODUCTION

### 1.1 Rationale of the Study

Agriculture always plays an essential role in the economy of every country especially in developing countries. Agriculture makes its contribution to economic development in following ways: By providing food and raw material to non-agricultural sectors of the economy, 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, by providing investable surplus in the form of savings and taxes to be invested in non-agricultural sector, earning valuable foreign exchange through the export of agricultural products and by providing employment to a vast army of uneducated, backward and unskilled labour. Agriculture also provides agricultural raw materials for industrial production. Increase in demand for industrial products leads to development of industrial sector. If the industrial sector is developed, economic growth of the country is developed. Therefore, agriculture assists a great deal in economic development of that country.

Like all other developing countries, Myanmar is an agricultural dominated country. In other words, the agricultural sector development can partly determine the economic development of Myanmar. Development of agricultural sector leads the development of the economy and social status and other infrastructure of the state.

Myanmar is richly endowed with agricultural resources, particularly land resources. It is quite important for policymakers as well as economists to realize that the country still possesses large amounts of unexploited land and water resources. Moreover, the country also enjoys favorable climatic conditions for both tropical and subtropical agriculture.

The Ministry of Agriculture 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.

By rising the income and livelihood of rural area, all round development of nation could be achieved through raising agricultural production and export. Agriculture is as a source of employment and income for many small farmers, and of

foodstuffs and raw materials. Thus, agriculture's central role in the process of economic development implies that improving the lives of farmers improves the conditions for a substantial portion of the population and the country. In many developing countries, the higher rates of agricultural growth could bring higher rates of overall economic growth and without agricultural development, industrial development is not rapid. So, only agricultural development attained high industrial development.

In Rural, agricultural is mainly worked because Myanmar is the agriculture-based economy. In Taikkyi Township, the agricultural is worked. In this region, the major crops such as Paddy, Groundnut, Sesame, Sunflower, Matpe, Pedesein, Bocate and Pelul are cultivated. Other cultivated crops are several beans, fruits, vegetables and industrial crops and so on. Economic and social condition in Taikkyi Township depend on agricultural sector. Therefore, the study agricultural production in Taikkyi Township will be presented.

#### 1.2 Objective of the Study

- To study the growth of selected agricultural crops production in Taikkyi Township during the period from 2002-2003 to 2016-2017.

#### 1.3 Methods of the Study

The study mainly uses descriptive methods based on secondary data. These sources are collected from General Administration Department, Immigration and Manpower Department, Land Record Department, Agriculture and Irrigation Department, Agricultural Mechanization, Agriculture Department and Myanmar Agriculture Development Bank.

#### 1.4 Scope and Limitation of the Study

This study focus on Agricultural products in Taikkyi Township for the period 2002-2003 to 2016-2017. Only selected major crops are studied. The main crops are Paddy and Beans and Pulses such as Matpe, Pedesein, Bocate, Pelun and Oilseeds such as Groundnut, Sesame and Sunflower. This study does not include livestock and forestry.

## 1.5 Organization of the Study

The study is organized into six chapters. Chapter 1 is the Introduction. It includes the rationale, objective, method, scope and limitations and organization of the study. Chapter 2 contains the Literature Review. Chapter 3 gives the Historical Background of the Taikkyi Township. Chapter 4 consists of the Utilization of Major Agricultural Inputs. Chapter 5 describes the Production and Distribution of Agriculture Sector in Taikkyi Township. Chapter 6 describes conclusion.

## CHAPTER II

### LITERATURE REVIEW

#### 2.1 Supports of Agriculture Sector

The six major contributions of agriculture to economic development are food and fiber, labor, capital, foreign exchange, market demand and rural welfare.

##### (1) Food and Fiber

Growing population, rising incomes that accompany economic development and a high proportion of income increase spent on food and fiber make increased food and fiber production a key contribution of agriculture to economic development. If food production fails to keep pace with demand in early stages of development, food prices tend to rise.

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

##### (2) Labor

It is a principal productive factor. The development of labor utilization can lead to economic development. The transfers of surplus labor from agriculture to industry can provide a source of economic development. Technologies that improve labor productivity in agriculture are necessary, so are investments in rural infrastructure. Investments in rural education simultaneously enhance labor's productivity in agriculture and its potential to work in industry. These investments help smooth the flow of agriculture labor to industry.

##### (3) Capital

Capital requirement for economic development are enormous. Capital is needed for modern economic structure. For most countries, the major source of capital is domestic savings. During the early stage of development, domestic savings primarily come from agriculture, except the countries with large earnings from petroleum or mineral exports.

#### (4) Foreign Exchange

Foreign exchange is needed for the import of key raw materials and capital goods. The agricultural sector can make significant contributions for foreign exchange needs. Many developing countries have relied on exports of agricultural commodities as their major source of foreign exchange. Others have attempted to reduce their foreign exchange needs by increasing agricultural production to displace imports of food.

#### (5) Market Demand

High agricultural income creates the potential for a substantial expansion of domestic demand for consumer goods and agricultural inputs. Even though agriculture requires relatively few inputs from industry, the consumption demand generated by growing agricultural productivity provides market for the nonagricultural sector.

#### (6) Rural Welfare

Agricultural development can have significant direct impacts on rural welfare. From that level, it can lead to overall economic development. If agricultural productivity is increased, farmers receive benefits both through increased home consumption and through income generated from product sales. Agriculture sector also stimulate non-agriculture sector's growth. Farmers spend their income on consumer goods that come from the modern sectors. This benefits the modern sector.

Even in developed countries, where agriculture's share of total rural economic activities is relatively small, rural welfare is closely linked to the growth of agriculture. In developing countries, stagnant agriculture can lead to increased rural poverty. Thus, since such a large portion of the population is found in rural areas, the rural welfare contribution of agriculture is vital to national welfare.

### 2.2 Agricultural Development and the Poor

One of the most common misconceptions about poverty is that it is largely an urban problem. Pictures of teeming slums with inadequate sanitation and rotting infrastructure help bolster this perception. In contrast, rural residents are thought to live in relatively spacious conditions and to be able to rely on own-production of foods in times of dire need. In fact, on a global level, the rural poor make up more than three-fourths of the total poor, and rural poverty is twice as prevalent as urban poverty. Rural poverty is a major problem and agricultural development can play a

major role in its reduction, but agricultural development can also alleviate urban poverty.

Agricultural technology has direct impacts on the rural poor by increasing incomes of farmers, many of whom may be poor. Care must be taken during development and subsequent release of new technologies to ensure that they are accessible to poor producers, but evidence shows that in many cases poor producers benefit directly. Indirect benefits to the poor from growth in agriculture come from two primary sources: increased demand for labor and increased supply of food, causing food prices to drop. The latter benefit can be substantial and is an important global poverty fell from the early 1980s until recently. Food price declines have led to higher levels of living even for people who do not depend directly on agriculture. When global food markets tighten as they did recently, poverty rises due to the indirect effect of higher food prices.

### 2.3 Agriculture and Employment Interactions

Agricultural development can provide food, labor and capital to support increased employment in industry and can stimulate demand in rural areas for employment-intensive consumer goods. Because of their comparative advantage in labor-intensive production, many developing countries will need to import capital-intensive goods, such as steel and fertilizer, and export labor-intensive consumer goods and certain types of agricultural goods. Countries that do not match an employment-oriented industrial policy with their agricultural development policy will fail to realize the potential income and employment benefits of agricultural development.

### 2.4 Agricultural Production

Agricultural production is particularly important for the incomes and nutritional status of the poor, because in most developing countries the poorest people have no choice but to be farmers, and they feed themselves and their families using their own labor and available land. Increased productivity for those farmers not only raises their incomes and purchasing power, but can also lower the price of food for those who must buy it to feed their families, making it possible for the poor to purchase larger quantities. Increased use of purchased inputs, improved marketing and credit institutions, improved agricultural policies, better education, effective

agricultural research and investment in infrastructure such as roads and irrigation systems are particularly important.

## 2.5 Agriculture and the Economic Transformation

The pace of the economic transformation has important implications to both the role and the strategy of agricultural development. On the one hand, the pace of the transformation is a key determinant of the size and rate of change of the agricultural labor force, which in turn affects labor and capital productivity and incomes in agriculture. On the other hand, the extent and rate of transformation and specific nature of the agricultural sector determine the extent to which economic development depends on capital formation in agriculture and transfers of capital from agriculture to other sectors.

It is likely that production in the nonagricultural sector can be expanded at least in proportion to the increase of capital and labor input. Hence, as successive investments in the nonagricultural sector reinforce each other, it is quite likely that production expands more than proportionately with increased capital and labor input.

If further growth in the agricultural labor force, with proportionate growth in agricultural capital, causes significant decline in the marginal productivity of labor and capital, then it is to the advantage and indeed urgent for the agricultural sector to invest in expansion of the nonagricultural sector. If the marginal productivity of labor and capital in agriculture is maintained as labor and capital increase in the same proportion, then somewhat less urgency attaches to the economic transformation, however, the balance of forces is still likely to favor a concentration of investment in the nonagricultural sector. If on the other hand, the marginal productivity of labor and capital can be raised in the agricultural sector through technological change, it may be economic to invest significant quantities of capital in the agricultural sector itself.

## 2.6 Structural-Change Models

Structural-change theory focuses on the mechanism by which underdeveloped economies transform their domestic economic structures from a heavy emphasis on traditional subsistence agriculture to a more modern, more urbanized, and more industrially diverse manufacturing and service economy.

In the Lewis model, the underdeveloped economy consists of two sectors: a traditional, overpopulated rural subsistence sector characterized by zero marginal



labor productivity – a situation that permits Lewis to classify this as surplus labor in the sense that it can be withdrawn from the traditional agricultural sector without any loss of output and a high-productivity modern urban industrial sector into which labor from the subsistence sector is gradually transferred. The primary focus of the model is on both the process of labor transfer and the growth of output and employment in the modern sector. Both labor transfer and modern-sector employment growth are brought about by output expansion in that sector. The speed with which this expansion occurs is determined by the rate of industrial investment and capital accumulation in the modern sector. Such investment is made possible by the excess of modern-sector profits over wages on the assumption that capitalists reinvest all their profits. Finally, Lewis assumed that the level of wages in the urban industrial sector was constant, determined as a given premium over a fixed average subsistence level of wages in the traditional agricultural sector. At the constant urban wage, the supply curve of rural labor to the modern sector is considered to be perfectly elastic.

This process of modern-sector self-sustaining growth and employment expansion is assumed to continue until all surplus rural labor is absorbed in the new industrial sector. Thereafter, additional workers can be withdrawn from the agricultural sector only at a higher cost of lost food production because the declining labor-to-land ratio means that the marginal product of rural labor is no longer zero. Thus the labor supply curve becomes positively sloped as modern-sector wages and employment continue to grow. The structural transformation of the economy will have taken place, with the balance of economic activity shifting from traditional rural agriculture to modern urban industry.

## 2.7 Stages of Economic Development

According to Rostow, the transition from underdevelopment to development can be described in terms of a series of steps or stages through which all countries must proceed. These stages are -

1. The traditional society
2. The Pre-condition for take off
3. The take off
4. Drive for maturity
5. The stages of high mass consumption.

(1) The traditional society

The traditional society is the stage whose structure is developed within limited production function based on Newtonian science and technology and on pre-Newtonian attitude towards the physical world. When men came widely to believe that the external world was subjected to a few low able laws and was systematically capable of manipulation. The conception of the traditional society is however, in no sense static, and it would not exclude increases in output. Acreage could be expanded from some adhoc, technical innovations could be introduced in trade, industry and agriculture: productivity could rise for instance with the improvement of irrigation or discovery and diffusion of new crops, but the central fact about traditional society remains the same. This resulted from the fact that potentialities which flows from modern science and technology were either not available or not regularly and systematically applied.

(2) The preconditions for take-off

This stage involves establishment of new routes, transport network and financial institution. It is characterized by a gradual expansion of trade and increase in external influences and introduction of modern methods of production which is used alongside with traditional techniques. The stage marks the spread of not nearly that of economic progress, but that economic progress is a necessary condition for other purposes. It be rational dignity, private profit, general welfare or a better life for the children, education for some at least. The scope of commerce internally and externally widens here and modern manufacturing enterprises appeared using new methods.

(3) The take off stage

This is the crucial stage which covers a relatively brief period of two or three decades in which the economy transforms itself in such a way that economic growth subsequently takes place more or less automatically. 'The take-off' is defined as 'the interval during which the rate of investment increases in such a way that real output per capita rises and this initial increase carries with it radical changes in the techniques of production and disposition of income flows which perpetuate the new scale of investment and perpetuate there by the rising trend in per capita output.'

The terms 'take-off' implies three things, firstly the proportion of investment to national income must rise from 12% to 15%, dennitely outstripping the likely population increase; secondly the period must be relatively short so that it should

show the characteristics of an economic revolution; and thirdly, it **must culminate** in self-sustaining and self-generating economic growth.

(4) The drive for maturity

Formally, we defined maturity as the stage in which an economy demonstrates the capacity to move beyond the original industries which powered take-off and to absorb and apply efficiently over a very wide range of its resources, if not the whole range. The stage of drive to maturity is characterized by steady consolidation of the new industrialized society. This stage is also characterized by continuous growth of investment and further expansion of industries as well as the development of large urban regional metropolitan development and improvement in transportation facilities. However, this is the stage in which the economy demonstrates that it has the technological knowledge as well as the entrepreneurial skill not to produce everything, but anything that they chose to produce. It may lack the raw materials or other supply conditions required to produce a given type of output economically, but it is a matter of economic choice or political priorities rather than the technological or institutional necessity.

(5) The age of high mass consumption

During this stage, the per capita real income increases to the level at which a large number of people can afford consumption transcending the basic food, shelter and clothing requirements. There is a tendency for the leading sectors to shift towards durable consumer goods and services. The structure of the working force changed in ways which increase not only the proportion of urban total population, but also the proportion of the working population in offices or in skilled factory jobs aware and anxious to require the consumption of the mature economy.

The developing countries were still in either the traditional society or the preconditions stage and had to follow a set of rules to take-off into self-sustaining economic growth. The principal strategy to help this take-off was the mobilization of domestic and foreign savings in order to generate sufficient investment to accelerate economic growth.

## 2.8 Summaries of Literature Review

Khaing Mar Htwe (2008) analyzed a study on agricultural production in Myanmar (1992-93 to 2004-2005). The aim and objectives of the study are to check

how changes in cropping patterns affect agricultural production, to examine the effects of agricultural policies and to view the likely trends in area and production of agricultural crops. According to this study, the author collected data from research papers, vital information from the Ministry of Agriculture and Irrigation, particularly from the Agricultural Planning Department. The author found that land utilization implemented by Ministry of Agricultural and Irrigation under esteem control of State Peace and Development Committee is efficient, effective, proper and appropriated system adaptable with Myanmar geo-political situation and the results can be seen as the positive impact on development process of Myanmar.

KhinHninWai(2008) examined a study on the agricultural reform in Myanmar (1987-2006). The study was based on information from Ministry of Agriculture and Irrigation and Central Statistical Organization. The author found that the improvements of land preparation, extensive use of irrigation, utilization of agricultural inputs for agricultural service and increased cropping intensity has led to diversification of crops in Myanmar's agricultural sector.

NwetNwet Aye (2011) explored agricultural production Phay District (1988-89 to 2007-2008). The study is mainly based on descriptive method relying on published data and statistics, official documents, research papers and vital information from the Ministry of Agricultural and Irrigation, particularly from the land Record Development in PhayDestricts.The author found that after implementing National Agricultural plans by Ministry of Agricultural and Irrigation, not only increased number of utilization of land, but also increased agricultural production and prices of selected agricultural crops. The study of agricultural production in Phay District supports the increased in agricultural production in helping the country's agricultural sector development.

Ei Mon Thin (2012) examined agricultural production in Bago Region (1988-2010).The author uses the descriptive methods based on literature and statistical records from various libraries. Therequires data are collected from respective Government offices and organization. The author found that Bago Region is suitable for double cropping like rice – bean and pulses, these area should be specialized as agricultural zones.Bago region will play a more important role in both pulses and rice and is expected to contribution much to the rationale as well as regional growth. Bago region has reached its full potential use of available agricultural lands.

Ye Winn (2012) analyzed a study on agricultural pattern and production in Bago Region and Ayeyarwady Region (1999-2000 to 2009-2010). This study based on secondary data. The requires data are collected from various sources. The author found that no free land active marketing was carried out in agricultural sector in Myanmar including Bago Region and Ayeyarwady Region about 20 years ago. The procurement price of the government is much lower than that in current market situation. When marketing assessment on paddy cultivation 20 years ago, sown acreage and production increased but the socio economic status of farmers did not improve significantly, due to high cost of agricultural inputs, high cultivation cost, inflation and low procurement price. Most of the small farmers lived in poverty within low investment, lack of self-sufficiency and advance-agricultural loans. So, farmers in Ayeyarwady Region and Bogo Region were deep in poverty.

Pan Myat Mon (2013) explored a study on summer paddy production in Myanmar during from 1990-1991 to 2009-2010. The author found that most of the processing facilities in Myanmar are adequate in terms of both quality and quantity, which seriously affects competitiveness and the prices obtained by farmers as well as export earnings. The most significant feature is allowing the private sector become engaged in agricultural marketing. The state can achieve better performance in the agricultural sector in collaboration with the private sector.

NwayHninEiEiKhaing (2014) analyzed agricultural production in Hlegu Township (2000-2012). This paper mainly based on descriptive methods. The requires secondary data are collected from several Government offices and organizations. The author found that input is not sufficient for agricultural sector development of Hlegu Township. Almost all farmers in Hlegu Township are lack of capital to mechanize their farms.

Bauk San (2014) analyzed a study on agricultural production in Nyaungshwe Township of Shan State. The study period from 2007-08 to 2012-13. The study based on uses descriptive method applying the secondary data and information. The author found that changes the situation of livelihood of local people in Inle Region by analyzing the major crops production. As the water source of Inle Lake serves as the resources for the people residing in the Lake Region, increasing environmental degradation is threatening the future of those people.

ShweZin Chit (2016) examined a study on selected crops production in Myanmar (2004-2014). This paper is also based on the information from secondary

data and the descriptive method. The author found that Myanmar is the **second largest** exporter of Beans in the world after Canada and the largest exporter in **South East Asia**. Myanmar is a leading nation of ASEAN in the production of **Matpe and Pedesin** and it is also top in Matpe and Pedesin exporting countries.

Aye ThandarOo (2017) explored a study on agricultural production in Magway Region (2005-2015). The study uses descriptive method based on secondary data. The author found that Paddy, Groundnut, Sesame and various Pulses are the most promising crops in Magway region. Pulses has good opportunity of Foreign Export market. Apart from these crops, Cotton, Maize, Sunflower, Castor and other vegetables are important in Magway region. Magway Region has the least irrigated land area in the dry zone (Sagain, Magway, Mandalay).

## CHAPTER III

### PROFILE OF TAIKKYI TOWNSHIP

#### 3.1 Historical Background of Taikkyi Township

The origin of Taikkyi Township was a small village which was located inside Hlaing province. Hlaing, the fortress town of Mon Empire in history during 40 years was of Innwa and Hantharwaddy, was kept setting as a province for the offices of local government after British Empire colonized lower Myanmar. In 1877, British government built Yangon- Pyay railway and then built a station at a village named Taikkyi Gone. Later, the railway station was shifted to a small village called Shan Su which was 2 miles away from the location of previous station and named the station as Taikkyi, then a gate guard station was accompanied. Hlaing government office shifted permanently to Taikkyi Station village which was crowded with the hub of transportation in 1896, then changed the name as Taikkyi Township. Taikkyi Township was formed by the order or fiat of the ministry of home affairs and religion, according to the date 30.8.1972, serial number 133/26/sub (1).

Taikkyi Township is situated between North Latitude 17°-10' and 17°-48' and between East Longitude 95°-41' and 96°-8'. It is about 29 miles from East to West and 135 miles from South to North. It is 707.53 square miles wide. Taikkyi Township is bounded by Yangon Division and Hlegu Township in the East, Hmawby Township in the South, Ayeyarwaddy Division; Nyaung Don Township, Danuphyu Township and Zalun Township in the West and Bago Division and Tharyarwaddy Township in the North.

In topography of Taikkyi, mountain ranges descend from North to South and they descend from East to West near Hlaing River and foothills of them. The topography of Taikkyi Township is categorized as follow.

(a) The Western part, the land between Western bank of Hlaing River and East of Ayeyarwaddy River.

(b) The middle part, the land between East of Hlaing River and Bago mountain ranges.

(c) The Eastern part which include Ledge Mountains of Bago mountain ranges.

Taikkyi Township is a region which has a plenty of creeks and rivers and they are flowing from North to West. The well-known rivers are Ayeyarwaddy River,

Hlaing River and Bawlal River. The Ayeyarwaddy River flows from North to South by passing closely Ahpyauk Township and Yaebawthaung village. Hlaing River and Bawlal River flow from North to South by passing hard by groups of villages; Tallati, Thyatchaung, Minhlawa an Sinchan. Most water resources within the region are fresh water and can be used for agriculture and drinking. During the hot season, the average depths of Hlaing River and Bawlal River are about 15 feet and Ayeyarwaddy River's one is about 30 feet and they are in a situation which ships and motorboats can go through or along.

Taikkyi Township is located 100 feet above the sea level as an average. The highest mountain is Hmanpya Mountain and it is 1500 feet above the sea level, the lowest part of the township is 40 feet above the sea level. The high of Bago mountain range within Taikkyi Township is 255 feet above the sea level.

The climate of Taikkyi Township is warm. The highest temperature is 34°C and the lowest temperature is 24°C.

In Taikkyi Township, there are forests reserves, teak plantations and perennial plantations on the East of Ledge Mountains of Bago mountain ranges. On the West, Hlaing River, Bawlal River and Ayeyarwaddy River are flowing. These natural environments are being conserved not to be ruined. The current condition of natural environment has 36.6% of forest coverage. This is the coverage of forest reserves and there is no forest coverage out of the reserve areas.

### 3.2 Population, Race and Religion

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

#### 3.2.1 Organization of Taikkyi Township

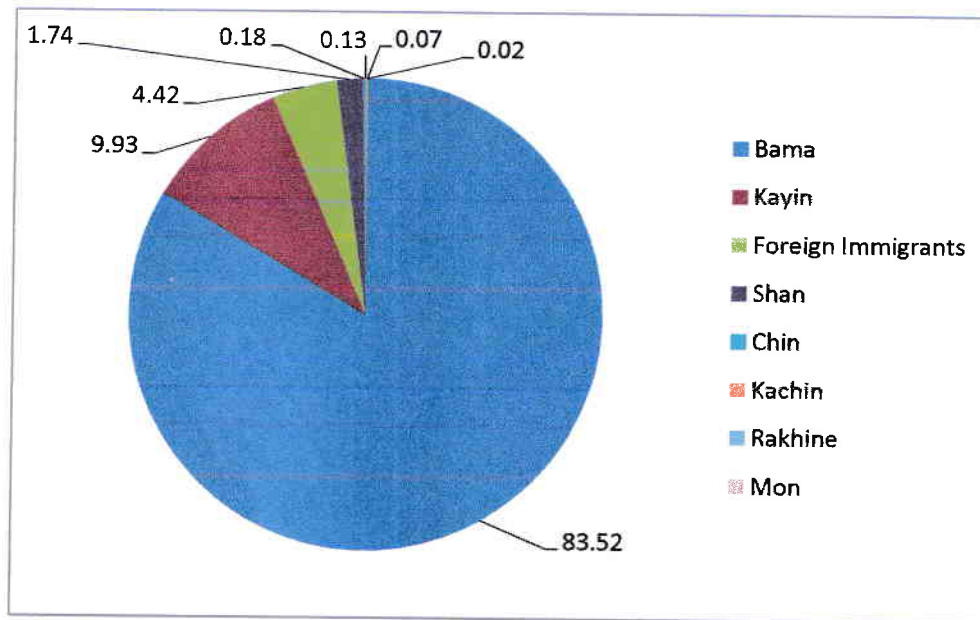
According to the General Administrative Department, Taikkyi Township is organized with 20 wards, 74 village tracts and 462 villages. The population is 267597 and the area is 707.53 square miles. Among them 31.73% of total population live in urban and 68.27% of people live in rural areas. Nearly 75% of the township people engaged in agricultural and 15.25% and 9.75% were government servants and job-workers respectively.



### 3.2.2 Structure of Population by Race and Religion

Different races live in Taikkkyi Township and among them Bama is the highest in percentage and Mon is the least in percentage. Foreign immigrants such as Chinese, Indian, Pakistan, Bilingual and other also live in the township. It is shown in the figure (3.1).

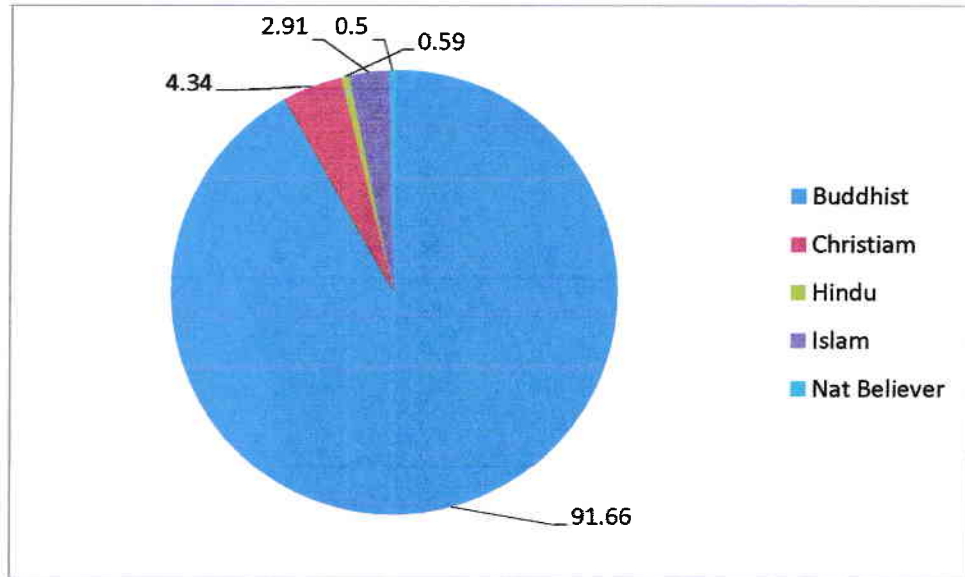
Figure (3.1) The Structure of Population by Race in Taikkkyi Township (2016-2017)



Source: General Administrative Development, Taikkkyi Township, 2017

In the figure (3.2) show Taikkkyi Township of population and religion. There are Buddhists, Christians, Hindus, Islam and Nat believer. The number of Buddhists is the largest. The number of Christian is second largest. The number of Islam is third largest. The number of Nat Believer is the least in this township.

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



Source: General Administrative Department, Taikkyi Township, 2017

### 3.2.3 Growth of Population

Population and annual growth rates are shown in table (3.1). According to the table (3.1), the population growth of Taikkyi Township is slowly increased during 2002-2003 to 2016-2017

Table (3.1) Estimated Population of Taikkyi Township by Sex (2002-2003 to 2016- 2017)

Year	Males	Percentage	Female	Percentage	Total
2002-2003	126707	48.00	137267	52.00	263974
2003-2004	127050	48.00	137638	52.00	264688
2004-2005	127844	48.00	138499	52.00	266343
2005-2006	128635	48.00	139356	52.00	267991
2006-2007	127267	48.00	137874	52.00	265141
2007-2008	126020	48.00	136522	52.00	262542
2008-2009	126640	48.00	137194	52.00	263834
2009-2010	128258	48.00	136339	52.00	264597
2010-2011	127506	48.00	138132	52.00	265638
2011-2012	127811	48.00	138462	52.00	266273
2012-2013	128956	48.00	139703	52.00	268659
2013-2014	128834	48.00	139571	52.00	268405
2014-2015	128695	48.00	139421	52.00	268116
2015-2016	128608	48.00	139326	52.00	267934
2016-2017	129713	48.47	137884	51.53	267597

Source: Immigration and Manpower Department, Taikkyi Township, 2017

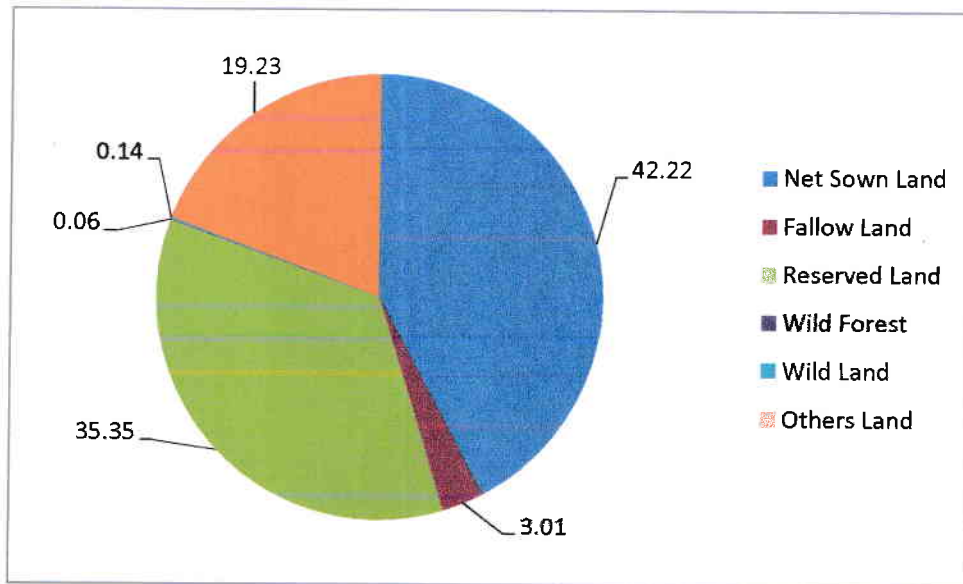
### 3.3 Land Utilization

The total land area of Takkyi Township is approximately 452816 acres. In this region, land area was 205341 acres. According to the appendix 3, it can be studied the land utilization in Taikkyi Township during the period from 2002-2003 to 2016-2017. The land use of Taikkyi Township can mainly be classified into four types. They are agricultural land, Reserved Forest, Wild forest, Wild Land and Others Land. Agricultural land can be classified into two types, net sown land and fallow land. Others are includes such as for urban and rural areas, religious land, cemeteries, industrial land and land under water bodies that river, steam, lakes and ponds.

According to the appendix 3, net sown area is increased from 195127 acres in 2002-2003 to 196876 acres in 2008-2009. In from 2009 to 2017, the net sown area is decreased from 196748 acres to 191174 acres. Fallow land is decreased from 15475 acres in 2002-2003 to 13649 acres in 2016-2017. Similarly, Reserved Forest and Wild

Land decreased from 2002-2003 to 2016-2017. In from 2002 to 2017, the Wild Forest is not change. Others Land is increased from 76862 acres in 2002-2003 to 87057 acres in 2016-2017.

Figure (3.3) Land Utilization in Taikkyi Township (2002-2003 to 2016-2017)

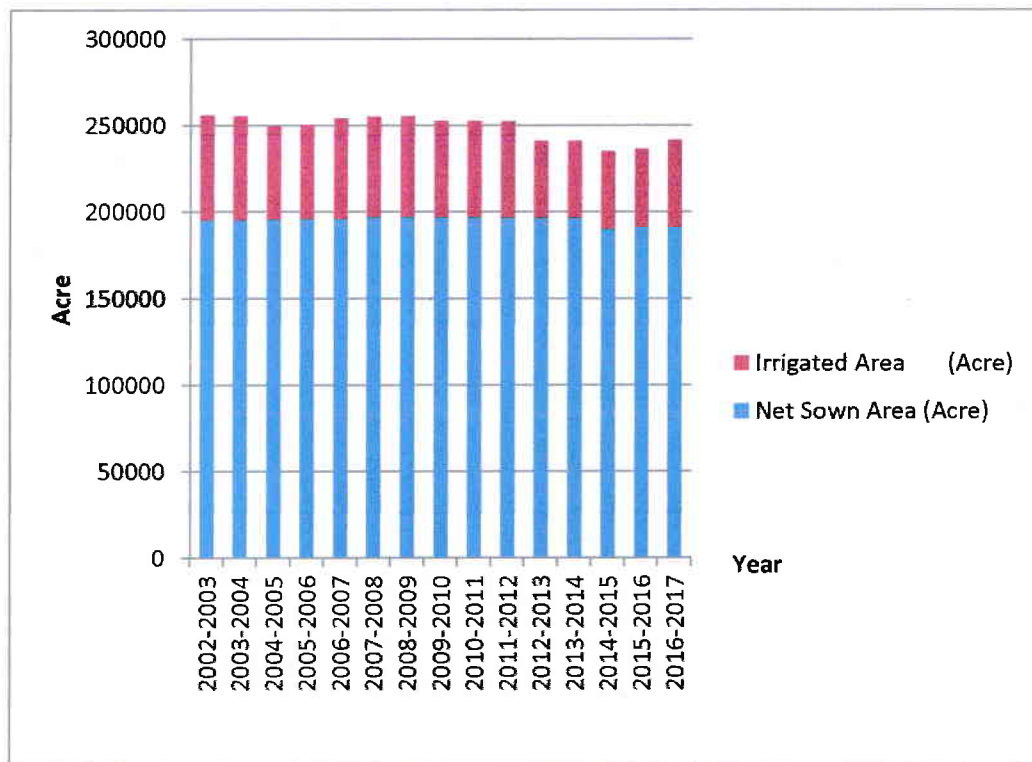


**Source:** Land Record Department, Taikkyi Township, 2017

### 3.4 Irrigation

After 1988, the Government put forward continuous efforts in the construction of dams and reservoirs throughout the country by using large capital investment, manpowers and machines. In Taikkyi Township, one dam was constructed after 1995. This is TabueHla dam. The irrigated areas varies from year to year. Figure (3.5) shows the irrigated areas during the period from 2002-2003 to 2016-2017.

Figure (3.4) Irrigated Area in Taikkyi Township (2002-2003 to 2016-2017)

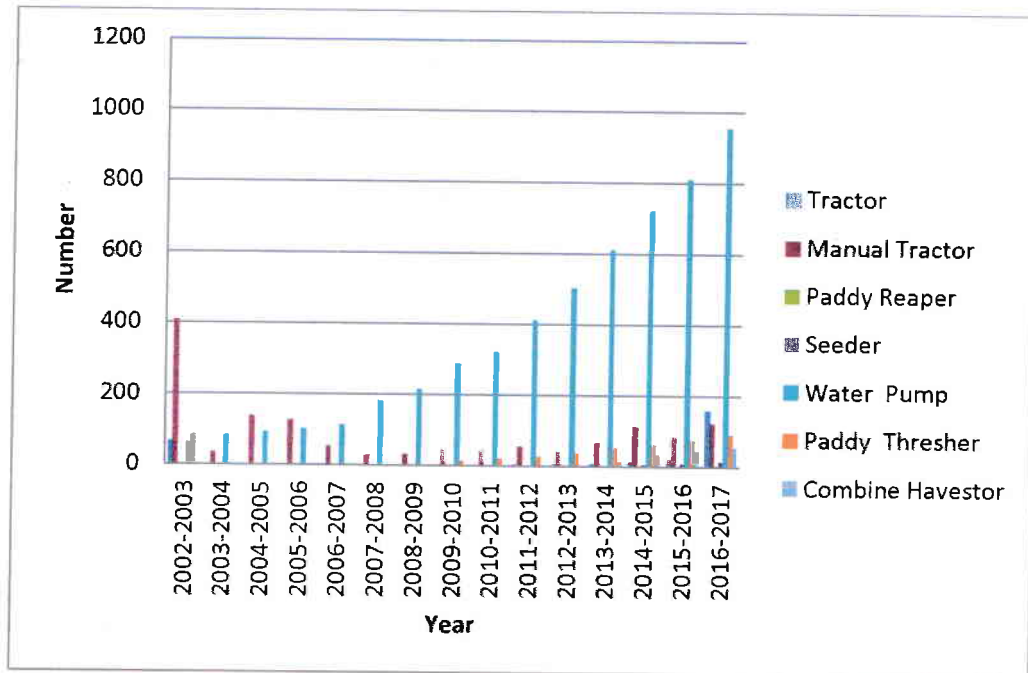


Source: Agriculture and Irrigation Department, Taikkyi Township, 2017

### 3.5 Agricultural Mechanization

Draught animals are still the main source of power in Myanmar Agricultural. Agricultural mechanization was introduced in 1970. In Taikkyi Township, among the farm machineries, water pump are the most utilized machine. Manual Tractor is second more utilize. Paddy Reaper is the least use machine. The condition of utilizations of various farm machineries by the farmers can be seen in figure (3.5), the utilizations of machine power has been increased year by year.

Figure (3.5) Utilization of Machineries and Farm Implements in Taikkyi Township (2002-2003 to 2016-2017)



Source: Agricultural Mechanization Department, Taikkyi Township, 2017

### 3.6 Use of Chemical Fertilizers and Pesticides

Application of chemical fertilizers is very important in agricultural as it can increase the yield and hence the total production of crops. The major use of chemical fertilizer was Urea, T-Super, Potash and Compound in Taikkyi Township. The most widely used chemical fertilizers in Taikkyi Township is Urea. Nowadays, farmers sometimes have to use pesticides to kill pest or insects destructive to crop. Table (3.2) shows the use of chemical fertilizers in Taikkyi Township during period from 2002-2003 to 2016-2017.

Table (3.2) Use of Chemical Fertilizer and Pesticide in Taikkyi Township (2002-2003 to 2016-2017)

Year	Urea (in tons)	T-Super (in tons)	Potash (in tons)	Compound (in tons)
2002-2003	2945	820	992	1217
2003-2004	3108	1026	806	958
2004-2005	3210	953	202	1123
2005-2006	3439	1102	763	826
2006-2007	3625	765	812	998
2007-2008	3795	674	563	1223
2008-2009	3931	527	892	1405
2009-2010	4028	1203	682	339
2010-2011	4292	1323	538	598
2011-2012	4425	552	483	1055
2012-2013	4673	493	395	1135
2013-2014	4952	322	512	1207
2014-2015	5102	205	836	1332
2015-2016	5584	882	1112	908
2016-2017	5927	225	1311	887

Source: Agricultural Department, Taikkyi Township, 2017

### 3.7 Farm Implements

Agriculture implements and draught animals are also the essential part in the farming operation. Farmers have to rely on draught animals for power. During the transitional period, moving toward mechanized, farming, traditional implement are still in use. The most commonly used implements are plough and harrow. The use of farm implements by the farmers in Taikkyi Township can be seen in table (3.3).

Table (3.3) Use of Farm Implements in Taikkyi Township (2016-2017)

No	Subject	Number
1	Plough	16050
2	Harrow	15880
3	Cart	9865
4	Cattle	76293
	Total	118088

Source: General Administrative Department, Taikkyi Township, 2017

### 3.8 Agricultural Loans

Provision of various crop loans for different cultivation seasons that is monsoon and winter season crops are made by the Myanmar Agricultural Development Bank. Similarly, medium and long term loan for the procurement of draught cattle, farm, implements and machineries and farm development programs are available for agricultural sector development. Myanmar Agricultural Development Bank in Taikkyi Township has credited year loan for agricultural developments. There are two types of loan. They are monsoon season loan and winter season loan. According to table (3.4) loan for monsoon season is greater than loan for winter season. The loans was increased from year to year. Table (3.4) shows monsoon season loan and winter season loan.



Table (3.4) Agricultural Loans in Taikkyi Township (2002-2003 to 2016-2017)

Year	Monsoon Season Loan (Kyats)	Winter Season Loan (Kyats)
2002-2003	590000000	28040000
2003-2004	598000000	32000000
2004-2005	620000000	49800000
2005-2006	624000000	51000000
2006-2007	6247.15000	522.44000
2007-2008	7388.20000	12300000
2008-2009	8288.20000	140000000
2009-2010	20100100000	502000000
2010-2011	9298100000	10534.40000
2011-2012	5727100000	28958.40000
2012-2013	5427000000	4204500000
2013-2014	12077200000	4102000000
2014-2015	12226900000	4072800000
2015-2016	9926200000	2818500000
2016-2017	128251.50000	3006000000

Source: Myanmar Agricultural Development Bank, Taikkyi Township, 2017

## CHAPTER IV

### TYPES OF MAJOR CROPS IN AGRICULTURE PRODUCTION IN TAIKKYI TOWNSHIP

#### 4.1 Production of Major Agricultural Crops

Major agricultural crops are cereal crops, beans and pulses and oilseed crops. Cereal crop includes paddy. Beans and pulses contain matpe, pedesein, bocate and pelun. Oilseeds crops consist groundnut, sesame and sunflower.

In Taikkyi Township, the major agricultural crops of production for each year are shown in the table (4.1). In the table (4.1), the production of cereal was increased from 11401147 tons in 2002-2003 to 13511269 tons in 2010-2011. From 2011-2012 to 2016-2017, the production of cereal was decreased from 13146079 tons to 11846524 tons. The production of beans and pulses was increased from 245443 tons in 2002-2003 to 712301 tons in 2016-2017. The production of oilseeds was increased from 195915 tons in 2002-2003 to 269207 tons in 2005-2006. In 2006-2007, the production of oilseeds was decreased. After 2007, the production of oilseeds was increased. But the production oilseed was decreased from 203755 tons in 2008-2009 to 51203 tons in 2014-2015. In 2015-2017, the production of oilseeds was increased. In the table (4.2), show the growth rate of major agricultural crops. According to the table (4.2), major crops of growth rate has changed a little.

Table (4.1) Production of Major Crops in Taikkyi Township (2002-2003 to 2016-2017)

Year	Cereals			Beans and Pulses						Oilseeds			
	Paddy	Matpe	Pedesein	Bocate	Pelum	Total	Groundnut	Sesame	Sunflower	Total			
2002-2003	11401147	224148	580	3421	17294	245443	143544	39786	12585	195915			
2003-2004	12304127	370512	3901	12798	14621	401832	71469	60284	23417	155170			
2004-2005	11965518	415666	9263	-	26249	451178	126618	62495	58648	247761			
2005-2006	12780968	467114	5076	10042	19801	502033	139708	68910	60589	269207			
2006-2007	13178810	509135	5543	10055	34676	559409	130507	35920	86632	253059			
2007-2008	13208054	546561	5771	9974	42498	604804	158652	42115	57525	258292			
2008-2009	12629113	568719	5510	9158	40762	624149	104618	59974	39163	203755			
2009-2010	13493834	572248	3220	12221	39792	627481	187321	47443	15496	250260			
2010-2011	13511269	598955	2016	11703	30498	643172	148634	46545	4003	199182			
2011-2012	13146079	601815	3138	13319	34072	652344	130479	43916	1930	176325			
2012-2013	12233627	638397	1734	13386	35403	688920	142042	43257	2217	187516			
2013-2014	12633648	637476	2864	13566	35005	688911	147728	47481	2156	197365			
2014-2015	12932386	641503	5184	13680	34542	694909	-	49104	2099	51203			
2015-2016	12155915	657366	5601	13880	34437	711284	116101	48496	1650	166247			
2016-2017	11846524	660016	3847	14153	34285	712301	121676	43528	1900	167104			

Source : Agricultural Department, Taikkyi Township, 2017

Table (4.2) Growth Rate of Cereals, Beans and Pulses and Oilseeds Crops in Taikkyi Township (2002-2003 to 2016-2017)

Year	Total Production			Growth Rate		
	Cereals	Beans and Pulses	Oilseeds	Cereals	Beans and Pulses	Oilseeds
2002-2003	11401147	245443	195915	1.76	49.36	43.60
2003-2004	12304127	401832	155170	7.92	63.72	-20.80
2004-2005	11965518	451178	247761	-2.75	12.28	59.67
2005-2006	12780968	502033	269207	6.81	11.27	8.66
2006-2007	13178810	559409	253059	3.11	11.43	-6.00
2007-2008	13208054	604804	258292	0.22	8.11	2.07
2008-2009	12629113	624149	203755	-4.38	3.20	-21.11
2009-2010	13493834	627481	250260	6.85	0.53	22.82
2010-2011	13511269	643172	199182	0.13	2.50	-20.41
2011-2012	13146079	652344	176325	-2.70	1.43	-11.48
2012-2013	12233627	688920	187516	-6.94	5.61	6.35
2013-2014	12633648	688911	197365	3.27	-0.001	5.25
2014-2015	12932386	694909	51203	2.36	0.87	-74.06
2015-2016	12155915	711284	166247	-6.00	2.36	224.68
2016-2017	11846524	712301	167104	-2.55	0.14	0.52

Source: Agricultural Department, Taikkyi Township, 2017

#### 4.2 Cereal

Areas of Cereal crops, occupy the largest proportion of the total sown area and major crops like paddy play the important role in domestic consumption. Major cereal crop is paddy in Taikkyi Township.

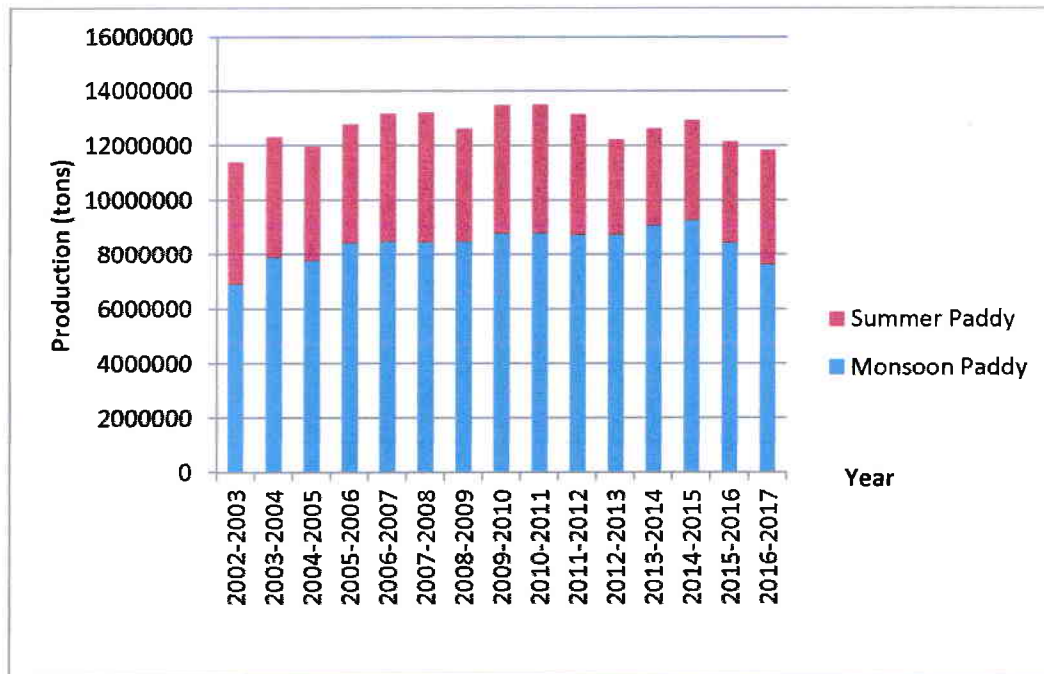
##### Paddy

For Myanmar people, rice is not only a traditional and cultural product but also the staple food of the country, that has not yet any close substitute for their diet. Among the cereal crops, paddy, wheat and maize are most important paddy dominates

all other cereal crops in terms of sown area. The total sown area in Taikkyi Township is approximately 178314 acres in 2016-2017. Appendix 6 shows the total sown area paddy, yield per acre and the total production from 2002-2003 to 2016-2017.

According to appendix 6, in 2002-2003 to 2014-2015, the sown area of monsoon paddy was increased from 117033 acres to 128195 acres. In 2002-2003 to 2014-2015, harvested area was increased. After 2015, harvested area was decreased. During the period from 2002-2003 to 2016-2017, yield per acres was increased from 63.84 basket to 71.79 basket. The total production was increased from 6908509 tons in 2002-2003 to 7646645 tons in 2016-2017. In 2002-2003 to 2016-2017, the sown area of summer paddy was decreased from 60975 acres to 50119 acres. The total production of summer paddy was decreased from 4492638 tons in 2002-2003 to 4199879 tons in 2016-2017. In 2002-2003 to 2016-2017, the total sown area of paddy was increased from 178008 acres to 178314 acres. The total harvested area was in increased from 169191 acres in 2002-2003 to 182194 acres in 2011-2012. After 2012, the harvested area was decreased. In 2002-2012, the total production of paddy was increased from 11401147 tons to 13146079 tons. In 2012-2013 to 2016-2017, the total production was decreased from 12233627 tons to 11846524 tons. This is due to natural disasters, usage of fertilizer, usage of water and such difficulties. Figure (4.1) show the production of paddy in 2002-2003 to 2016-2017.

Figure (4.1) Production of Monsoon Paddy and Summer Paddy by Taikkyi Township (2002-2003 to 2016-2017)



Source: Agricultural Department, Taikkyi Township, 2017

#### 4.3 Beans and Pulses

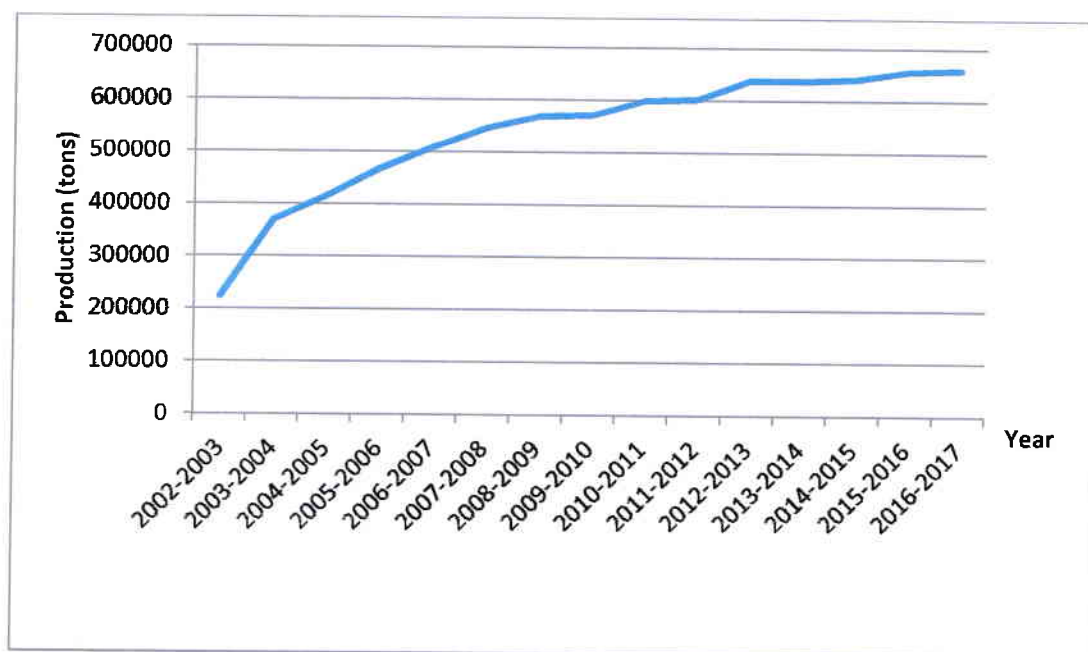
In Taikkyi Township, beans and pulses are produced after paddy. This is formed a major source of food for the vast majority of the Myanmar people. In Taikkyi Township, many kinds of beans and pulses are cultivated in sown area. These cultivated beans and pulses are Matpe, Pedesein, Bocate and Pelun.

##### Matpe

Matpe was cultivated second crops in Taikkyi Township. The sown area and production of matpe during the period from 2002-2003 to 2016-2017 are shown in appendix 7. According to appendix 7, in 2002-2003 the sown area of matpe was 26812 acres and yield per acres was 8.36 basket. The total production of matpe was 224148 tons. The sown area of matpe increased from 26812 acres in 2002-2003 to 38939 acres in 2016-2017. The harvested area was increased from 26812 acres in 2002-2003 to 38939 acres in 2016-2017. The yield per acres of matpe was increased from 8.36 basket in 2002-2003 to 16.95 basket in 2016-2017. The total production of matpe increased from 224148 tons in 2002-2003 to 660016 tons in 2016-2017. During

the period from 2002-2003 to 2016-2017 the sown area and the production of matpe was increased because of the government encouragement to the farmers. The market of matpe was also significantly widespread year by year.

Figure (4.2) Production of Matpe in Taikkyi Township (2002-2003 to 2016-2017)



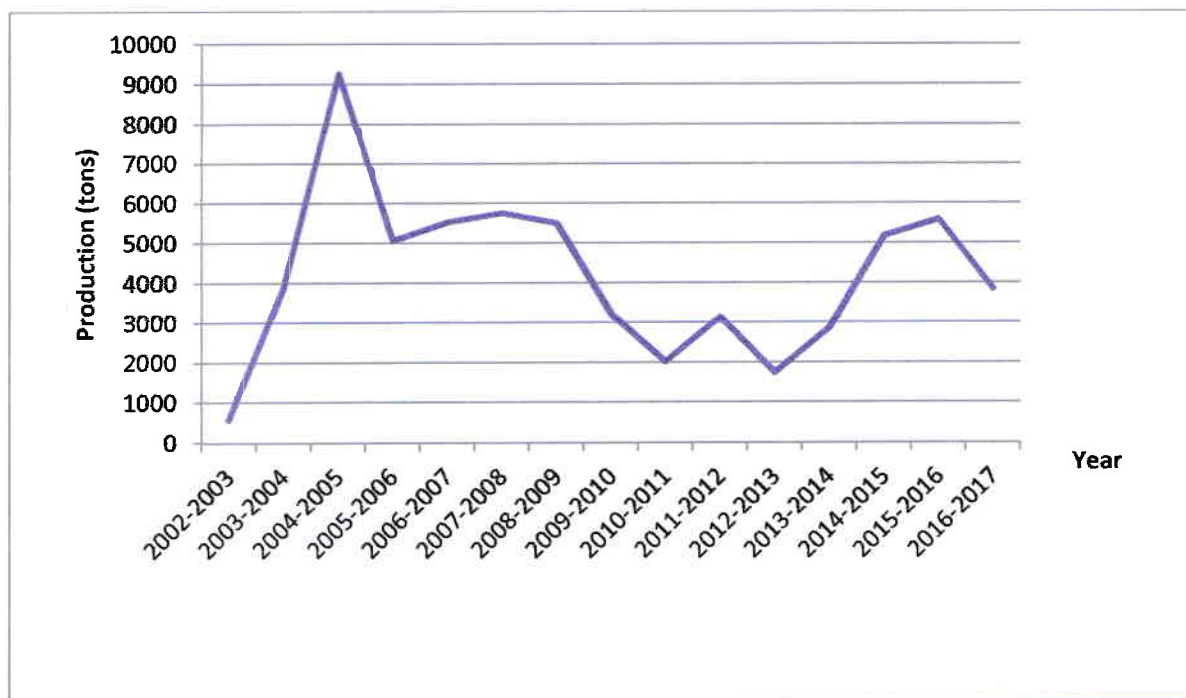
Source: Agricultural Department, Taikkyi Township, 2017

### Pedesein

Pedesein is also one of the important beans and pulses. In appendix 8, in 2002-2003, the lower growth of sown area and production was 65 acres and 580 tons. The harvested area was 65 acres and yield per acres was 8.93 basket. In 2004-2005, the highest growth of sown area and production was 741 acres and 9263 tons because of increase in market demand. The harvested area was 741 acres and yield per acres was 12.50 basket. In 2005-2006 to 2008-2009, the sown area and total production was increased from 361 acres to 388 acres and from 5076 tons to 5510 tons. The harvested area was increased from 361 acres in 2005-2006 to 388 acres in 2008-2009. In 2005-2006 to 2008-2009, yield per acres was increased from 14.06 basket in 14.20 basket. In 2009-2010 to 2012-2013, the sown area and production was decreased from 226 acres to 121 acres and from 3220 tons to 1734 tons because of lower prices and demand of pedesein. The harvested area was decreased from 226 acres in 2009-2010 to 121 acres in 2012-2013. In 2013-2016, the sown area and total production was increased. In 2016-2017, the sown area and harvested area was increased. But, yield

per acres and total production was decreased because seeds not good. Figure (4.3) shows production of pedesein in 2002-2003 to 2016-2017.

Figure (4.3) Production of Pedesein in Taikkyi Township (2002-2003 to 2016-2017)



Source: Agricultural Department, Taikkyi Township, 2017

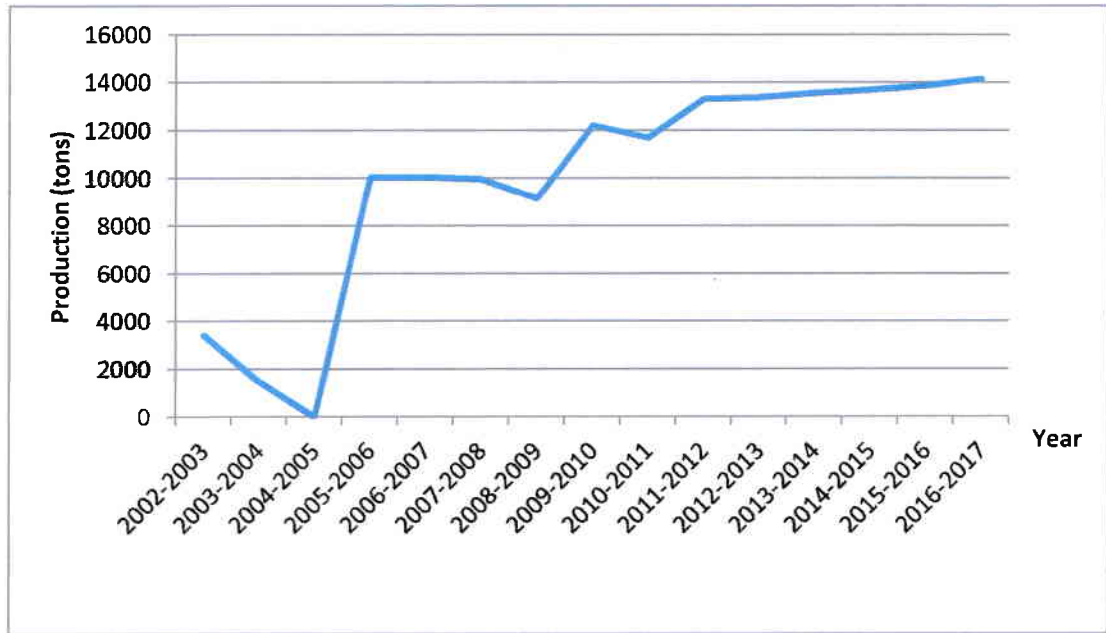
### Bogate

Among the beans and pulses group, bocate is bean given very little attention compared to other major crops. According to appendix 9, in 2002-2003, the sown area and production of bocate was 516 acres and 3421 tons. The harvested area and yield per acres was 516 acres and 6.63 basket. In 2003-2004, the sown area and production was 351 acres and 1485 tons. The harvested area and yield per acres was 351 acres and 4.23 acres. In 2004-2005, bocate were not cultivated in Taikkyi Township because of decrease in market demand. This year pedesein were cultivated instead of bocate. The sown area of bocate were increased from 908 acres in 2005-2006 to 989 acres in 2016-2017. The harvested area was increased from 908 acres in 2005-2006 to 989 acres in 2016-2017. The yield per acres was increased from 11.06 basket in 2005-2006 to 14.31 acres in 2016-2017. The total production of bocate were increased



from 10042 tons in 2005-2006 to 14153 tons in 2016-2017. Figure (4.4) shows production of bocate in 2002-2003 to 2016-2017.

Figure (4.4) Production of Bocate in Taikkyi Township (2002-2003 to 2016-2017)

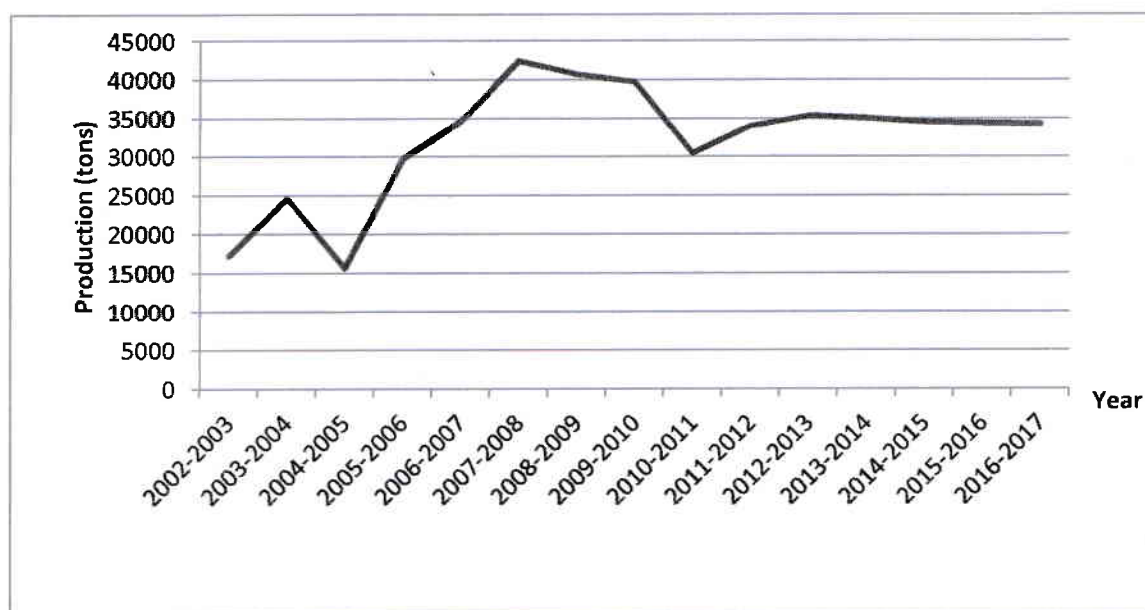


Source: Agricultural Department, Taikkyi Township, 2017

#### Pelun

Among beans and pulses, pelun is also little cultivated in Taikkyi Township. In 2002-2003 to 2007-2008, the sown area of pelun was increased from 2369 acres to 2939 acres. The harvested area was increased from 2369 acres in 2002-2003 to 2939 acres in 2007-2008. The yield per acres was increased from 7.30 basket in 2002-2003 to 14.46 basket in 2007-2008. The total production was increased from 17294 tons in 2002-2003 to 42498 tons 2007-2008. The harvested area and yield per acres was decreased from 2008-2009 to 2016-2017. In 2008-2009 to 2016-2017, the sown area and the total production of pelun was decreased because of quality seeds and fertilizers. In 2002-2003 to 2016-2017, production of pelun can be seen in figure (4.5).

Figure (4.5) Production of Pelun in Taikkyi Township (2002-2003 to 2016-2017)



Source: Agricultural Department, Taikkyi Township, 2017

#### 4.4 Oilseeds

Oilseeds crops play a vital role in Myanmar's high consumption of cooking oil. Cultivation of oil producing plants is important in Taikkyi Township. Major oilseed crops are groundnut, sesame and sunflower.

##### Groundnut

Groundnut is cultivated for edible oil production in Taikkyi Township. The sown area of groundnut was decreased from 4262 acres in 2002-2003 to 2702 acres in 2006-2007. The harvested area was decreased from 4262 acres in 2002-2003 to 2702 acres in 2006-2007. The total production was decreased from 143544 tons in 2002-2003 to 130507 tons in 2006-2007. In 2007-2008 to 2009-2010, the sown area was increased from 3051 acres to 3373 acres. The harvested area was increased from 3051 acres in 2007-2008 to 3353 acres in 2009-2010. In 2007-2008 to 2009-2010, the total production was increased from 158652 tons to 187321 tons because yield per acres was increased. In 2010-2011 to 2013-2014, the sown area was decreased from 3012 acres to 2857 acres. The harvested area was increased from 3012 acres in 2010-2011 to 2857 acres in 2013-2014. In 2010-2011 to 2013-2014, the total production of groundnut was decreased. In 2014-2015, Groundnut was not cultivated in

Taikkyi Township. In 2015-2016 to 2016-2017, the sown area and production was increased. Paddy is the first priority and different kinds of beans and pulses and oilseeds crops follow it. If the paddy is harvested late, there may be some difficulties to cultivate Beans and pulses, and oilseeds crops, because they cannot get enough time to grow well. Thus, the cultivation of groundnut has been decreasing year by year. Figure (4.6) shows the production of groundnut in 2002-2003 to 2016-2017.

Figure (4.6) Production of Groundnut in Taikkyi Township (2002-2003 to 2016-2017)



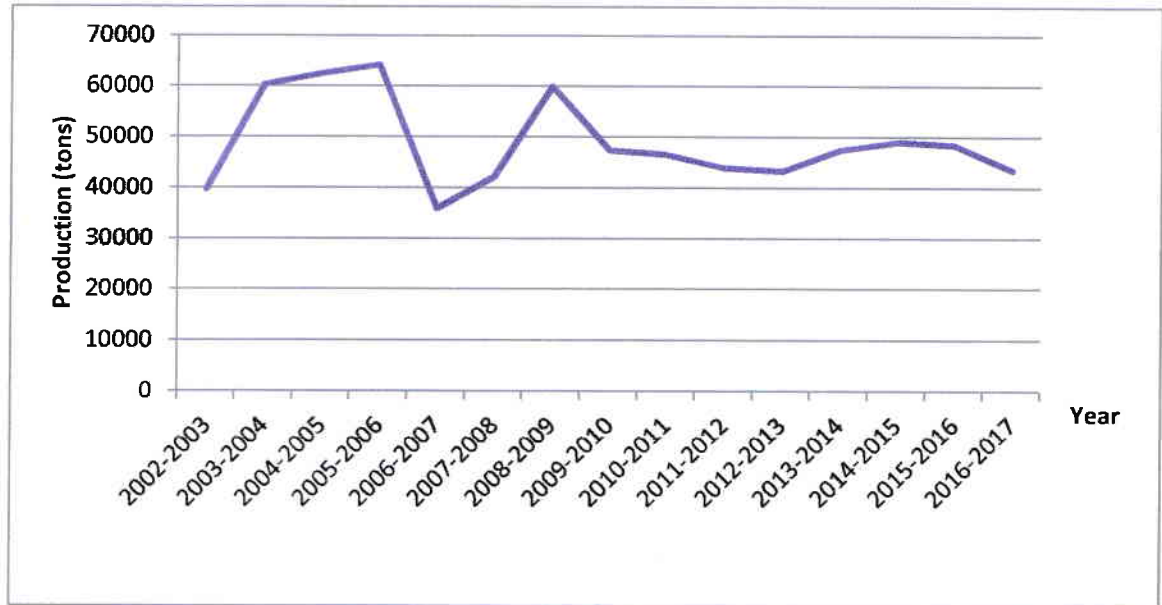
Source: Agricultural Department, Taikkyi Township, 2017

### Sesame

In Taikkyi Township, sesame is grown during the winter season. In 2002-2003 to 2004-2005, the sown area of sesame was increased from 6076 acres to 9286 acres. The harvested area was increased from 6076 acres in 2002-2003 to 9286 acres in 2004-2005 acres. The yield per acre was increased from 6.55 basket in 6.73 basket. In 2002-2003 to 2005-2006, the total production was increased from 39786 tons to 64183 tons. In 2005-2006 to 2006-2007, the sown area was decreased from 8145 acres to 4451 acres. The harvested area was decreased from 8145 acres to 4451 acres. The sown area was increased from 6744 acres in 2007-2008 to 6854 acres 2008-2009. In 2007-2008 to 2008-2009, the harvested area was increased from 6744 acres to 6854 acres. In 2006-2007 to 2008-2009, the total production was increased from 35920 tons to 59974 tons because yield per acres was increased. After 2009, the sown area of

sesame was decreased from 4701 acres to 4226 acres. After 2009, the total production was decreased. This was the quality of seeds, fertilizers and adequate water supply. During the 2002-2003 to 2016-2017, the total production of sesame can be seen in figure (4.7).

Figure (4.7) Production of Sesame in Taikkyi Township (2002-2003 to 2016-2017)



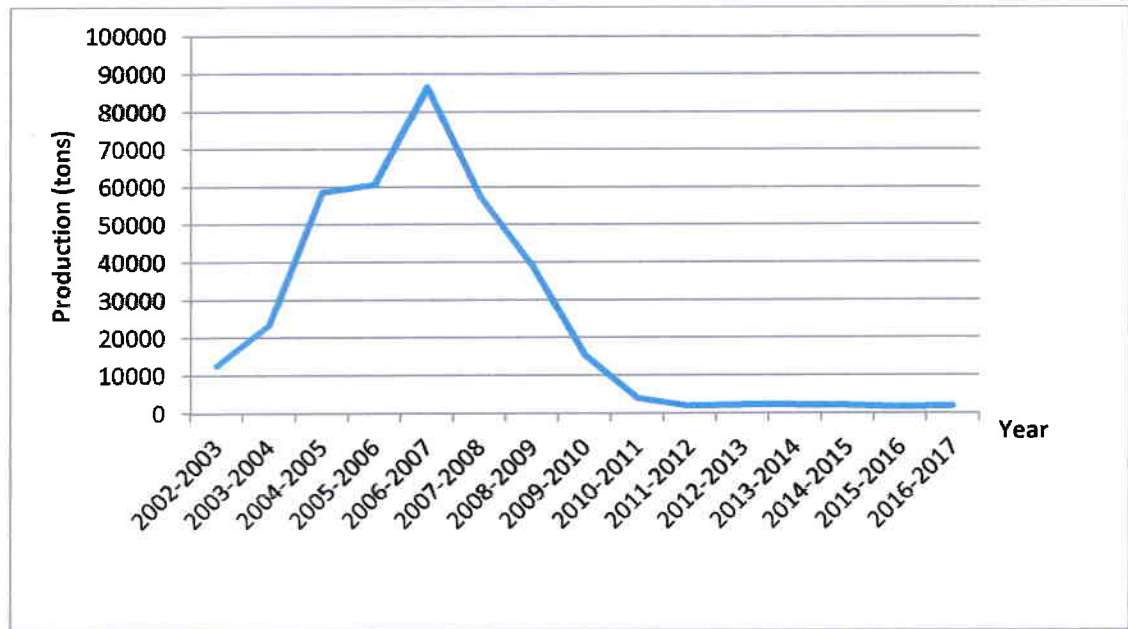
Source: Agricultural Department, Taikkyi Township, 2017

### Sunflower

Another important crops for oilseed crop producing is sunflower. Appendix 13, shows the sown area and production of sunflower for the period 2002-2003 to 2016-2017. In 2002-2003 to 2006-2007, the sown area was increased from 3142 acres to 4323 acres. The harvested area was increased from 1587 acres in 2002-2003 to 4323 acres in 2006-2007. The yield per acres was increased from 7.93 basket in 2002-2003 to 4323 basket 2006-2007. The total production was increased from 12585 tons in 2002-2003 to 86632 tons in 2006-2007 because of increase demand for sunflower. The harvested area and yield per acres was decreased from 2007-2008 to 2016-2017. After 2007, the sown area and total production of sunflower was significantly decreased due to the lack of favourable weather condition. The reason is that the authorities concerned cannot distribute all the necessities for cultivation. Also, there are some problems in using machine-equipments because authorities are not able to

support all of their needs. Because of all these things, the productivity of sunflower has been decreasing.

Figure (4.8) Production of Sunflower in Taikkyi Township (2002-2003 to 2016-2017)



Source: Agricultural Department, Taikkyi Township, 2017

## CHAPTER V

### CONCLUSION

#### 5.1 Findings

The main crops cultivated in Taikkyi Township are Cereal crop (Paddy), Beans and Pulses (Matpe, Pedesein, Bocate and Pelum), Oilseeds (Goundnut, Sesame and Sunflower).

Paddy crops such as monsoon paddy and summer paddy are grown as main food crops. The sown area of monsoon paddy increased 117033 acres in 2002-2003 to 128195 acres in 2016-2017. In 2002-2003, 2004-2005, 2006-2007, 2007-2008, 2012-2013, 2015-2016 and 2016-2017, the sown area and the harvested area are not the same due to natural disasters and difficulties. The sown area of summer paddy decreased from 60975 acres in 2002-2003 to 50119 acres in 2016-2017 depending on water supplies and chemical fertilizer.

The production of beans and pulses has been increased year by year. During the period from 2002-2003 to 2016-2017, the sown area and production of matpe were increased according to sharp market demand. The sown area and production of pedesein were lowest in 2002-2003. The sown area and production of pedesein were highest in 2004-2005. From 2002-2003 to 2016-2017, the sown area and production of bocate were increased year by year. But 2004-2005, bocate was not cultivated due to market condition. In the year 2004-2005, pedesein were cultivated instead of bocate. In 2002-2003 to 2007-2008, the sown area of pelun was increased from 2369 acres to 2939 acres. The total production was increased from 17294 tons in 2002-2003 to 42498 tons 2007-2008. In 2008-2009 to 2016-2017, the sown area and the total production of pelun was decreased because of quality seeds and fertilizers.

In 2003-2004, the sown area and production of groundnut were lowest. In 2014-2015, groundnut was not cultivated because paddy is harvested late. After 2015-2016, the sown area and production of groundnut were increased because of market demand. From 2002-2003 to 2005-2006, the production of sesame were increased from 39786 tons to 64183 tons. After 2006-2007, the production of sesame were decreased due to machinery and fertilizer. In 2006-2007, the sown area and total production of sunflower was increased due to increase demand for sunflower. After

2007-2008, the sown area and production of sunflower were significantly decreased year by year due to lack of favourable weather condition.

## 5.2 Suggestions

To increase the productivity of the region, farmers need agricultural inputs such as land, irrigation, machinery, technology, quality seeds, agricultural credit, fertilizers and other inputs. Moreover, it must be remembered that increase agricultural products through crops intensification and diversification efforts.

Crops intensification can only be feasible if there are sufficient supplies of major inputs like irrigation water, fertilizers, seeds, agricultural machinery and farm credit. Some of these inputs can be supplied by the state but inputs like fertilizers and seed can be well managed by the private sector. Major inputs like irrigation water or machinery are normally handled by the state except for small village irrigation schemes which can be implemented by local communities themselves.

Some farmers use their own seeds which are often of poor quality. A lack of quality seeds directly tend to low productivity. To achieve the production targets, it needs the good quality of seeds, modernized farming techniques and other necessities. With these agricultural sector in operation, there will definitely be more enhanced production for the export market. If the agricultural sector of Taikkyi Township is developed, the living standard of labor in the agricultural sector is improved. Moreover, if the agricultural sector is transformed to the industrial sector, the surplus labor in the agricultural sector is absorbed in the new industrial sector. The real wages in the industrial sector is increased.

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## APPENDIX

### APPENDIX (1)

#### The Structure of population by Race in Taikkyi Township (2016-2017)

No	Race	Population	Percentage (%)
1	Bama	223489	83.52
2	Kayin	26564	9.93
3	Foreign Immigrants	11821	4.42
4	Shan	4652	1.74
5	Chin	490	0.18
6	Kachin	337	0.13
7	Rakhine	194	0.07
8	Mon	50	0.02
	Total	267597	100

Source: General Administrative Development, Taikkyi Township, 2017

## APPENDIX (2)

### The Structure of Population by Religion in Taikkyi Township (2016-2017)

No	Religion	Population	Percentage (%)
1	Buddhist	245285	91.66
2	Christiam	11604	4.34
3	Hindu	1569	0.59
4	Islam	7798	2.91
5	Nat Believer	1341	0.50
	Total	267597	100

Source: General Administrative Department, Taikkyi Township, 2017

### APPENDIX (3)

Land Utilization in Taikkyi Township (2002-2003 to 2016-2017)

Year	Net Sown Land		Fallow Land		Reserved Land		Wild Forest		Wild Land		Others Land		Total Area of Township
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	
2002-2003	195127	43.09	15475	3.42	163669	36.14	250	0.06	1433	0.32	76862	16.97	452816
2003-2004	195385	43.15	15337	3.39	163457	36.10	250	0.06	1322	0.29	77065	17.02	452816
2004-2005	195600	43.21	15222	3.36	163320	36.07	250	0.06	1235	0.27	77189	17.05	452816
2005-2006	195785	43.24	15066	3.33	163235	36.05	250	0.06	1215	0.27	77265	17.06	452816
2006-2007	195970	43.28	14981	3.31	163110	36.02	250	0.06	1113	0.25	77392	17.09	452816
2007-2008	196708	43.44	14453	3.19	162990	35.99	250	0.06	950	0.21	77465	17.11	452816
2008-2009	196876	43.48	14232	3.14	162950	35.99	250	0.06	940	0.21	77568	17.13	452816
2009-2010	196748	43.45	14356	3.17	162890	35.97	250	0.06	920	0.21	77652	17.15	452816
2010-2011	196675	43.43	14295	3.16	162890	35.97	250	0.06	852	0.19	77854	17.19	452816
2011-2012	196576	43.41	14396	3.18	162790	35.95	250	0.06	852	0.19	77952	17.21	452816
2012-2013	196494	43.39	14279	3.15	162680	35.93	250	0.06	836	0.19	78277	17.29	452816
2013-2014	196494	43.39	14279	3.15	162365	35.86	250	0.06	1151	0.25	78277	17.29	452816
2014-2015	190355	42.04	14121	3.12	162049	35.79	250	0.06	811	0.18	85230	18.82	452816
2015-2016	191220	42.23	14121	3.12	160064	35.35	250	0.06	741	0.16	86420	19.09	452816
2016-2017	191174	42.22	13649	3.01	160064	35.35	250	0.06	622	0.14	87057	19.23	452816

Source: Land Record Department, Taikkyi Township, 2017

APPENDIX (4)

Irrigated Area in Taikkyi Township (2002-2003 to 2016-2017)

Year	Net Sown Area (Acre)	Irrigated Area (Acre)	Percentage of Irrigated Area (Acre)
2002-2003	195127	60975	31.25
2003-2004	195385	60208	30.82
2004-2005	195600	54571	27.90
2005-2006	195785	54783	27.98
2006-2007	195970	58267	29.73
2007-2008	196708	58567	29.77
2008-2009	196876	58619	28.21
2009-2010	196748	55962	28.44
2010-2011	196675	55998	28.47
2011-2012	196576	56007	28.49
2012-2013	196494	44292	22.54
2013-2014	196494	44424	22.61
2014-2015	190355	44586	23.42
2015-2016	191220	44929	23.30
2016-2017	191174	50119	26.22

Source: Agriculture and Irrigation Department, Taikkyi Township, 2017

APPENDIX (5)

Utilization of Machineries and Farm Implements in Taikkyi Township (2002-2003 to 2016-2017)

Year	Tractor	Manual Tractor	Paddy Reaper	Seeder	Water Pump	Paddy Thresher	Combine Harvester
2002-2003	68	409	-	-	62	86	-
2003-2004	-	34	-	-	86	-	-
2004-2005	-	138	-	-	93	-	-
2005-2006	-	128	-	-	102	-	-
2006-2007	-	52	-	-	114	-	-
2007-2008	-	28	-	-	180	-	-
2008-2009	-	31	-	-	215	-	-
2009-2010	-	45	-	-	288	14	-
2010-2011	-	42	-	-	322	20	-
2011-2012	3	54	-	-	412	26	-
2012-2013	5	42	-	-	503	37	-
2013-2014	6	68	-	-	612	51	15
2014-2015	13	112	-	5	722	62	33
2015-2016	23	86	-	8	810	75	42
2016-2017	160	123	3	13	955	92	53

Source: Agricultural Mechanization Department, Taikkyi Township, 2017

## APPENDIX (6)

Production of Monsoon Paddy and Summer Paddy by Taikkyi Township (2002-2003 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)	Sown Area (Acres)	Harvested (Acres)	Production in (tons)	
2002-2003	117033	108216	63.84	6908509	60975	60975	73.68	4492638	178008	169191	11401147	178008	169191	11401147	
2003-2004	122753	122753	64.26	7888108	60208	60208	73.35	4416019	182961	182961	12304127	182961	182961	12304127	
2004-2005	123308	118531	65.65	7781560	54571	54571	76.67	4183958	177879	173102	11965518	177879	173102	11965518	
2005-2006	124459	124459	67.80	8438320	54783	54783	79.27	4342648	179242	179242	12780968	179242	179242	12780968	
2006-2007	125181	125088	67.91	8494726	58267	58267	80.39	4684084	183448	183355	13178810	183448	183355	13178810	
2007-2008	125861	125195	67.79	8486969	58567	58567	80.61	4721085	184428	183762	13208054	184428	183762	13208054	
2008-2009	125290	125290	67.89	8505938	58619	58619	81.93	4123175	183909	183909	12629113	183909	183909	12629113	
2009-2010	125433	125433	70.03	8784073	55962	55962	84.16	4709761	181395	181395	13493834	181395	181395	13493834	
2010-2011	125703	125703	70.11	8813037	55998	55998	83.90	4698232	181701	181701	13511269	181701	181701	13511269	
2011-2012	126187	126187	69.36	8752330	56007	56007	78.45	4393749	182194	182194	13146079	182194	182194	13146079	
2012-2013	126207	125772	69.63	8757588	44292	44292	78.48	3476039	170499	170499	12233627	170499	170499	12233627	
2013-2014	127188	127188	71.36	9075730	44424	44424	80.09	3557918	171612	171612	12633648	171612	171612	12633648	
2014-2015	127545	127545	72.82	9287966	44586	44586	81.74	3644420	172131	172131	12932386	172131	172131	12932386	
2015-2016	127545	115364	73.34	8460762	44929	44929	82.24	3695153	172474	160293	12155915	172474	160293	12155915	
2016-2017	128195	106504	71.79	7646645	50119	50119	83.80	4199879	178314	156623	11846524	178314	156623	11846524	

Source: Agricultural Department, Taikkyi Township, 2017

## APPENDIX (7)

## Production of Matpe in Taikkyi Township (2002-2003 to 2016-2017)

Year	Sown Area (Acres)	Harvested (Acres)	Yield Per Acres (Basket)	Production in (tons)
2002-2003	26812	26812	8.36	224148
2003-2004	27912	27912	13.27	370512
2004-2005	30012	30012	13.85	415666
2005-2006	32166	32166	14.94	467114
2006-2007	33965	33965	14.99	509135
2007-2008	33676	33676	16.23	546561
2008-2009	34848	34848	16.32	568719
2009-2010	35172	35172	16.27	572248
2010-2011	37087	37087	16.15	598955
2011-2012	37195	37195	16.18	601815
2012-2013	37030	37030	17.24	638397
2013-2014	36998	36998	17.23	637476
2014-2015	37124	37124	17.28	641503
2015-2016	37998	37998	17.30	657366
2016-2017	38939	38939	16.95	660016

Source: Agricultural Department, Taikkyi Township, 2017



## APPENDIX (8)

## Production of Pedesein in Taikkyi Township (2002-2003 to 2016-2017)

Year	Sown Area (Acres)	Harvested (Acres)	Yield Per Acres (Basket)	Production in (tons)
2002-2003	65	65	8.93	580
2003-2004	432	432	9.03	3901
2004-2005	741	741	12.50	9263
2005-2006	361	361	14.06	5076
2006-2007	374	374	14.82	5543
2007-2008	386	386	14.95	5771
2008-2009	388	388	14.20	5510
2009-2010	226	226	14.25	3220
2010-2011	141	141	14.30	2016
2011-2012	219	219	14.33	3138
2012-2013	121	121	14.33	1734
2013-2014	200	200	14.32	2864
2014-2015	362	362	14.32	5184
2015-2016	395	395	14.18	5601
2016-2017	427	427	9.01	3847

Source: Agricultural Department, Taikkyi Township, 2017

## APPENDIX (9)

## Production of Bocate in Taikkyi Township (2002-2003 to 2016-2017)

Year	Sown Area (Acres)	Harvested (Acres)	Yield Per Acres (Basket)	Production in (tons)
2002-2003	516	516	6.63	3421
2003-2004	351	351	4.23	1485
2004-2005	-	-	-	-
2005-2006	908	908	11.06	10042
2006-2007	893	893	11.26	10055
2007-2008	878	878	11.36	9974
2008-2009	884	884	10.36	9158
2009-2010	860	860	14.21	12221
2010-2011	830	830	14.10	11703
2011-2012	934	934	14.26	13319
2012-2013	942	942	14.21	13386
2013-2014	952	952	14.25	13566
2014-2015	960	960	14.25	13680
2015-2016	972	972	14.28	13880
2016-2017	989	989	14.31	14153

Source: Agricultural Department, Taikkyi Township, 2017

## APPENDIX (10)

## Production of Pelun in Taikkyi Township (2002-2003 to 2016-2017)

Year	Sown Area (Acres)	Harvested (Acres)	Yield Per Acres (Basket)	Production in (tons)
2002-2003	2369	2369	7.30	17294
2003-2004	2482	2482	9.92	24621
2004-2005	2481	2481	10.58	15669
2005-2006	2621	2621	11.37	29801
2006-2007	2582	2582	14.43	34676
2007-2008	2939	2939	14.46	42498
2008-2009	2941	2941	13.86	40762
2009-2010	2871	2871	13.86	39792
2010-2011	2210	2210	13.80	30498
2011-2012	2386	2386	14.28	34072
2012-2013	2474	2474	14.31	35403
2013-2014	2495	2495	14.03	35005
2014-2015	2462	2462	14.03	34542
2015-2016	2451	2451	14.05	34437
2016-2017	2435	2435	14.08	34285

Source: Agricultural Department, Taikkyi Township, 2017

## APPENDIX (11)

## Production in Groundnut in Taikkyi Township (2002-2003 to 2016-2017)

Year	Sown Area (Acres)	Harvested (Acres)	Yield Per Acres (Basket)	Production in (tons)
2002-2003	4262	4262	33.68	143544
2003-2004	2035	2035	35.12	71469
2004-2005	2649	2649	47.80	126618
2005-2006	2912	2912	47.98	139708
2006-2007	2702	2702	48.30	130507
2007-2008	3051	3051	52.00	158652
2008-2009	3349	3349	55.12	104618
2009-2010	3373	3353	55.86	187321
2010-2011	3012	3012	49.34	148634
2011-2012	2688	2688	48.54	130479
2012-2013	2838	2838	50.15	142042
2013-2014	2857	2857	51.70	147728
2014-2015	-	-	-	-
2015-2016	2231	2231	52.04	116101
2016-2017	2335	2335	52.11	121676

Source: Agricultural Department, Taikkyi Township, 2017

## APPENDIX (12)

## Production in Sesame in Taikkyi Township (2002-2003 to 2016-2017)

Year	Sown Area (Acres)	Harvested (Acres)	Yield Per Acres (Basket)	Production in (tons)
2002-2003	6076	6076	6.55	39786
2003-2004	9198	9198	6.59	60284
2004-2005	9286	9286	6.73	62495
2005-2006	8145	8145	7.88	64183
2006-2007	4451	4451	8.07	35920
2007-2008	6744	4775	8.82	42115
2008-2009	6854	5674	10.57	59974
2009-2010	4701	4634	10.53	47443
2010-2011	4708	4708	10.30	46545
2011-2012	4326	4272	10.28	43916
2012-2013	4194	4194	10.31	43257
2013-2014	4303	4303	11.03	47481
2014-2015	4456	4456	11.02	49104
2015-2016	4355	4355	11.14	48496
2016-2017	4226	4226	10.30	43528

Source: Agricultural Department, Taikkyi Township, 2017

## APPENDIX (13)

## Production of Sunflower in Taikkyi Township (2002-2003 to 2016-2017)

Year	Sown Area (Acres)	Harvested (Acres)	Yield Per Acres (Basket)	Production in (tons)
2002-2003	3142	1587	7.93	12585
2003-2004	3173	3173	7.38	23417
2004-2005	3053	3053	19.21	58648
2005-2006	3074	3074	19.71	60589
2006-2007	4323	4323	20.04	86632
2007-2008	4327	3697	15.56	57525
2008-2009	2504	2504	15.64	39163
2009-2010	938	938	16.52	15496
2010-2011	242	242	16.54	4003
2011-2012	188	186	15.75	1930
2012-2013	143	143	15.50	2217
2013-2014	139	139	15.51	2156
2014-2015	135	135	15.55	2099
2015-2016	106	106	15.57	1650
2016-2017	123	123	15.45	1900

Source: Agricultural Department, Taikkyi Township, 2017