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MASTER OF ECONOMICS

A STUDY ON GROUNDNUT PRODUCTION IN BAGO REGION (2007 - 2017)

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A STUDY ON GROUNDNUT PRODUCTION IN BAGO REGION (2007 to 2017)

A thesis submitted as a partial fulfillment towards the requirement for the Master of Economics, MEcon (Economics) Degree.

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ABSTRACT

The study on groundnut production in Bago Region explores the land-use, sown area, yield per acrea and production of Groundnut and describes the related policies. In most developing countries, the agriculture sector has been playing a major role in the economic development. Groundnut is one of major oil crops in Myanmar. It has been essential for domestic consumption, and foreign exchange earnings; therefore the study of groundnut production is able to create the benefit for Myanmar's economy. The study intends to analyze the situation of the production of groundnut in Bago Region. This paper focuses on Groundnut production in Bago Region for the period 2007-2008 to 2016-2017. Both sown acres and production of groundnut has increased from 2007-2008 to 2015-2016 and decreased in 2016-2017. But Groundnut price has increased twice of that previous period in 20016-2017. Groundnut is important for domestic consumption and it has the possibility to be a vital export so that groundnut production should be promoted by supporting technology, infrastructure and financing to peasants.

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ABBREVIATIONS

LDCs Least Developed Countries

GDP Gross Domestic Product

CHAPTER (I)

INTRODUCTION

1.1 Rationale of the Study

Myanmar is typically an agro-based economy with agricultural sector playing a very important role in economic development. The country is endowed with a large cultural land potential area. Agriculture is preciously regarded as supportive role for industrialization. However, it is observed as a source of income for both individual and national level as well as for supporting global food security and alleviation of poverty.

Agriculture has a number of major contributions to the GDP and its growth .Myanmar's population is increasingly estimated total for 2016-2017 is approximately 54 million. Out of this total, about 65% are living in rural areas where farming is the main occupation. In Myanmar, agriculture sector contributes about 38% and employing more than 60% of workforce and 23% of export in 2016-2017.

The country's groundnut production has huge potential for development of agricultural sector. Groundnut is one of the most important oilseed crops which have been grown in monsoon and winter seasons. Groundnut seeds contain many valuable nutrients. Groundnut is a source of high quality protein to both human beings and livestock.

In Myanmar, groundnut serves as cooking oil, as snacks, as ingredients for other food and also as an export commodity. Hence, the cultivation of groundnut for domestic self-sufficiency particularly, as an edible oil, and as an attractive high quality commodity for export has commended major attention. While rice is consumed as basic staple food, edible oil is the second most important commodity in the daily diet of Myanmar people. The edible oil production of country is luck of self-sufficiency for the domestic requirements due to the increasing demand for edible oil consumption in both rural and urban areas.

Bago Region is a vest agricultural area which specializes in groundnut. In Bago Region, groundnut production is 1.52 million in 2016-2017. Since Bago Region is the fourth largest production of Groundnut in Myanmar, the study intends to emphasize the activities of groundnut production in this region. This paper intends to study how groundnut production can be promoted.

1.2 Objective of the study

The objective of the study is to analyze the cultivation and production of groundnut in Bago Region.

1.3 Method of study

The study uses a descriptive method based on secondary official data from statistical year books. The other facts are obtained from relevant websites, books and library.

1.4 Scope and limitations of the Study

This study focuses on groundnut production in Bago Region for the period from 2007-2008 to 2016-2017.

1.5 Organization of the Study

This thesis includes five chapters. Chapter one is Introduction .It includes the rationale, objective, method, scope and limitation and organization of the study. Chapter two contains the Literature Review. Chapter three gives the Historical Background of the Study Area. Chapter four describes the Production of Groundnut in Bago Region. Chapter fives discusses the finding of this study and recommendations.

CHAPTER (II)

LITERATURE REVIEW

2.1 The Origin of Groundnut

The groundnut plant probably originated in Brazil or Peru, although no fossil records exist to prove this. But for as long as people have been making pottery in South America (3,500 years or so) they have been making jars shaped like peanuts and decorated with peanuts. Graves of ancient Incas found along the dry western coast of South America often contain jars filled with peanuts and left with the dead to provide food in the afterlife. Tribes in central Brazil also ground peanuts with maize to make an intoxicating beverage for celebrations.

Groundnuts were grown as far north as Mexico by the time the Spanish began their exploration of the New World. The explorers took peanuts back to Spain, where they are still grown. From Spain, traders and explorers took peanuts to Africa and Asia. In Africa the plant became common in the western tropical region. The groundnut was regarded by many Africans as one of several plants possessing a soul.

When Africans were brought to North America as slaves, groundnut came with them. Slaves planted groundnuts throughout the southern United States. In the 1700's, groundnuts, then called groundnuts or ground peas, were studied by botanists and regarded as an excellent food for pigs. Records show that peanuts were grown commercially in South Carolina around 1800 and used for oil, food and a substitute for cocoa. However, until 1900 peanuts were not extensively grown, partially because they were regarded as food for the poor, and because growing and harvesting were slow and difficult until labor-saving equipment was invented around the turn of the century.

The first notable increase in U.S. peanut consumption came in 1860 with the outbreak of the Civil War. Northern soldiers, as well as Southern, used the groundnut as a food. During the last half of the 19th century, groundnuts were eaten as a snack, sold freshly roasted by street vendors and at baseball games and circuses. While peanut production rose during this time, peanuts were harvested by hand which left stems and trash in the peanuts. Thus, poor quality and lack of uniformity kept down the demand for groundnuts.

Around 1900, equipment was invented for planting, cultivating, harvesting and picking groundnuts from the plants, and for shelling and cleaning the kernels. With

these mechanical aids, peanuts rapidly came into demand for oil, roasted and salted nuts, peanut butter and candy. George Washington Carver began his research into groundnuts in 1903 at Tuskeegee Institute. Research that would lead him to discover improvements in horticulture and the development of more than 300 uses for peanuts (including shoe polish and shaving cream).

The talented botanist recognized the value of the groundnut as a cash crop and proposed that peanuts be planted as a rotation crop in the Southeast cotton-growing areas where the boll weevil insect threatened the regions' agricultural base. Farmers listened and the face of southern farming was changed forever. For his work in promoting its cultivation and consumption, Carver is considered the father of the peanut industry.

Soon, mechanized machinery simplified groundnut harvesting and processing. Peanut production rose rapidly during and after World Wars I and II as a result of the peanut's popularity with Allied forces, and as a result of the post-war baby boom. Street vendors began selling roasted peanuts from carts, as did vendors at circuses and baseball stadiums.

Today, groundnuts contribute over four billion dollars to the U.S. economy each year. Although the U.S. is a major exporter of edible peanuts to various countries around the world, they are grown in countries as far flung as Africa, China, Australia and Argentina.[1]

2.2 Geographical Condition Suitable for Groundnut Cultivation

Climatic conditions such as temperature and rainfall significantly influence the groundnut production. Warm and moist conditions are very favorable than cool and wet climate, which results in slow germination and seedling emergence, increasing the risk of seed rot and seedling diseases. Temperature is a major environmental factor that determines the rate of crop development. Temperatures above 35°C inhibit the growth of groundnut. Optimum mean daily temperature to grow is 30°C and growth ceases at 15°C. For rapid emergence, soil temperature above 21°C is needed. The optimum temperature for the most rapid germination and seedling development is about 30°C.

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[1] *www.frutas-hortalizas.com*

A minimum 100 - day optimum temperature growing season is necessary for successful groundnut crop production. Adequate and well distributed rainfall during the growing season, especially during flowering, pegging and pod formation stages, is essential for maximum yield and quality of groundnut. Groundnut is grown in areas receiving 600 to 1500 mm of rainfall. However, the crop can be grown successfully with a rainfall of 1250 mm.

The amount of rainfall required:

- Pre-sowing operations (preparatory cultivation) 100 mm
- Sowing 150 mm
- Flowering and pod development 400-500 mm

The groundnut crop cannot stand

- Frost for long
- Severe drought
- Water stagnation[2]

2.3 Production Process of Groundnut oil in Myanmar

Myanmar is a significant producer of oil seed crops. Approximately 16 percent of the cultivated area or nearly 7.5 million acres of land are sown with oil crops, which is the third most important crop group in Myanmar agriculture after cereals and pulses. The most extensive and traditional oilseed crop is sesame and the next is peanut also called groundnut. Up to now, it is world's largest producer of sesame seeds and the yield of sesame seed is above world average level; while groundnut production ranks on the sixth position and for mustard seeds on the third position. However, the qualified oil extracted from the oilseeds is limited which is mainly for domestic use. The oil processing industry is underdeveloped in Myanmar and the reason can attribute to the export prohibition in the early years and the poor development of the oil extraction technology.

Groundnut and groundnut oil

As for groundnut, Myanmar increased its production of groundnuts at a rather constant pace since 2003. The production increased from 0.9m tonnes in 2003 to 1.4m tonnes in 2013, making it the sixth largest producer of groundnuts in the world. The production value of groundnut accounts for nearly 5 percent of Myanmar's agriculture

[2] *www.agrifarming.in>tag>climate -requirement*

GDP and it occupies 24 percent of the oilseeds crops plantation area in the country, which is the second highest among all oilseed crops. The oil content of groundnuts seeds (without pods) is really high around 42-56%, therefor the groundnuts are mainly used for oil extraction and for domestic demand of the edible oil. Since groundnuts play a very important role in Myanmar's edible oil industry, its export has been controlled tightly by the government since the late 1980's and is largely banned. The strict restrictive policy constrain the development of the local oilseeds industries to a large extent.[3]

Production Process of Groundnut oil

Traditional edible oil processing technology has fallen behind the global trend, therefore it's urgent to update the current edible oil production equipment to improve the productivity.

For the production of high quality groundnut oil,

1. Shelling process of groundnut

The first step for making peanut oil is to remove the shells of peanuts and separate them from groundnut kernels by using automatic peanut shelling machine.

2. Peeling process of groundnut kernels

In order to get pure peanut oil, the red skin of groundnut kernels should be removed. Antiquated peanut peeling methods cannot support the large scale peeling process and its labor and time consuming. An advanced groundnuts peeling machine is the way to solve this problem. Automatic peanut peeling machine is suitable for many scale business which is specially designed for removing the red skin coat of the peanuts and making the peanuts taste much savories. And at the same time, automatic peanuts peeling machine keeps the peanut kernels as integral as possible.

3. Roasting process of groundnut

In this step, groundnuts are roasted in peanut roasting machine. High cooking temperature of groundnut roasting machine can make internal oil material move freely and easy to get out. Roasted peanuts have high oil extraction rate and low residual rate.

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[3] *http/www.linkedin.com/Myanmar-edible-oil-seed-processing-industry-anaysis*

4. Pressing process of groundnut oil

Roasted groundnut kernels are pressed by automatic oil press machine which is equipped with automatic temperature control system and oil filtering device to get quality

peanut oil.

5. Groundnut oil refining process

There are mainly five basic processing steps of groundnut refinery: degumming, neutralizing, bleaching, deodorising and dewaxing. Refined peanut oil have bright and pure color and are healthier to people.

2.4 Uses of Groundnut

The groundnut (seeds) are used for roasting or salting and for the preparation of peanut butter. Groundnuts are a very nutritious food. One lb. of peanuts yields 2700 cal. The filtered refined oil is used for cooking and in making margarine. Groundnut oil is important food oil. The oilcake is used as fodder. The vegetable ghee is made from the peanut oil after hydrogenation.

The kernels are also used in various foods and confectionery. They are ground and made into peanut butter. Peanut flour is prepared by grinding the finest grades of peanut cake; it is used for supplementing the white flour. Cake is used as feed for cattle and other farm animals; also used as manure. Cake has high nutritive value. Seed-coats are mixed with groundnut husk and the product is called groundnut bran.[4]

Groundnut oil is currently one of the most popular oils used in the kitchen, as it can be used for frying, sautéing, or simply adding a mild nutty flavor to dishes. Refined Groundnut oil has a neutral taste and does not taint or absorb the flavor of the foods cooked in it. In fact, multiple food types can be cooked in the same batch of peanut oil without cross-contaminating the flavors. But before you liberally use this oil for cooking, please remember that it has a high percentage of omega-6 fats, which can upset your omega 3:6 ratio and wreck your health. Coconut oil is a healthier cooking oil choice. Not only it is stable enough to resist heat-induce damage, but it also contains high amounts of saturated fats, which are essential to your health. Groundnut oil can also be used for aromatherapy. Some easy ways to use groundnut oil are

[4] *http/www.thespruceeats.com*

- As a massage oil to energize your body and help alleviate achy joint and muscles.
- To get rid of acne, mix a few drops of Groundnut oil with two to three drops of lime juice. Groundnut oil works for both natural skin and dry skin, and also helps protect your skin from blackheads.
- To treat dandruff. Simply mix a tablespoon of groundnut oil with a few drops of tea tree oil and lemon juice, and then apply to your scalp. Leave on for two to three hours and rinse with shampoo and water. This edible oil also helps reduce protein loss, thickens your hair, adds moisture to split ends, and regenerates your damaged hair.
- To moisturize your lips. Brush your lips with a soft toothbrush for three to four minutes, wipe with a cotton ball dipped in warm water until smooth, and then massage peanut oil onto your lips.

2.5 Polices on Oilseeds Crops

The production of crops was heavily influenced by state control and regulations including oil crops over the period. These control include farmer decision on crop choice and compulsory procurement of output for sale at price below market levels. This system started to change in the 1990s and one crop group, pulses, was effectively liberalized leading to a dramatic Jump in yields, sown acre and production, as well as in export. It was shown as a good example for other potential crops such as paddy and oil seed crops.

However, all market policies have not been liberalized. Although on compulsory purchasing exits for oil crops, state control on oil crops and edible oil sub-sectors were still in place until 1990s. These include outsight bens or controls of export and import of oil crops, oil meals edible oils. The most important restriction in international treed include the following commodities:

- Palm Oil import: more liberalized since 2003, but the volume of import and price are still controlled. Besides, the import of crude oils, such as crude palm oil, is prohibited.
- Oil crops seeds import is prohibited.
- Export of groundnut is prohibited.
- Export of sesamum: In October 1988, on export limitation for private traders was imposed until 2006, when export was authorized. The effects on export

volumes were immediate, reflecting both the competitive advantage Myanmar holds on the international market and the dynamism of the private sector. In 2007, export of sesamum may be further restricted.

The apparent logic of these limitations was that Myanmar is currently a deficit producer of edible oil and oilcake, while informal export of groundnuts for the snacks market allowed groundnut prices to be sustained on the domestic market.

Overall, there are essentially two major government policy objectives for the oil crops sub-sector until 2010:-

1. Achieve self-sufficiency in edible oil
2. Maintain edible oil price control to avoid fluctuations.

These two policies are self-defeating. Through the implementation of these policies, Myanmar has adopted restriction measures on imports and exports of oilseeds and oilseeds products, but relatively open policies to the imports of higher quantities of cheap palm oil, in an attempt to maintain edible oil prices at a low level on the domestic retail market. Oil crops products in Myanmar market price are heaving distorted resulting in stagnant production.

Over the decades, the production policy of oil crops has focused on maximizing output than farmer's income. Accordingly, production has increased considerably, but the income levels of the farmers in real terms not satisfactory. Moreover, overemphasis on paddy production prevent the development of crop diversification farmers have never received the full price of their produce due to low farm gate prices, on the one hand, and rising inflation, on the other. This has greatly dampened the motivation of the farmers to raise yields by undertaking land improvement activities.

The unnecessary interventions and interruptions in the implementation and managements of policies have also produced undesirable result such as distortions in the market and prices. This combined with the lack of funds and facilities, and the low level of technological resources have contributed to the poor economic growth. The persistence of the socialist mode of administration has spawned a more negative than positive impact. During 2008, government relaxed some policy measure on oilseed crops and removed the limitations August 2011.[5]

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[5] *Myat Ei Soe Thandar Win, "A Study on production of oilseeds I Myanmar" (2013)*

CHAPTER (III)

HISTORICAL BACKGROUND OF THE STUDY AREA

3.1 Historical Background of Bago Region

Various Mon language chronicles report widely divergent foundation dates of Bago, ranging from 573 CE to 1152 CE while the Zabu Kuncha, an early 15th century Burmese administrative treatise, states that Pegu was founded in 1276/77 CE. The earliest extant evidence of Bago as a place dates only to the late Bagan Period (1212 and 1266) when it was still a small town, not even a provincial capital. After the collapse of the Pagan Empire, Bago became part of the breakaway Kingdom of Martaban by the 1290s.[6]

The small settlement grew increasingly important in the 14th century as the region became most populous in the Mon-speaking kingdom. In 1369, King Banya U made Bago the capital. The city remained the capital until the kingdom's fall in 1538/39.

During the reign of King Razadarit, Bago and Ava Kingdom were engaged in the Forty Years' War. The peaceful reign of Queen Shin Sawbupu came to an end when she chose the Buddhist monk Dhamazaydi(1472–1492) to succeed her. Under Dhammazaydi, Bago became a center of commerce and Theravada Buddhism.

The capital was looted by the viceroy of Tounggoo, Minye Thihathu II of Tounggoo, and then burned by the viceroy of Arakan during the Burmese–Siamese War (1594–1605). Anaukpetlun wanted to rebuild Hongsawadi, which had been deserted since Nanda Bayin had abandoned it. He was only able to build a temporary palace, however.The Burmese capital relocated to Ava in 1634. In 1740, the Mon revolted and founded the Restored Hanthawaddy Kingdom. However, a Bama king, Alaungpaya, captured the city in May 1757.

Bago was rebuilt by King Bodawpaya (1782-1819), but by then the river had shifted course, cutting the city off from the sea. It never regained its previous importance. After the Second Anglo-Burmese War, the British annexed Bago in 1852. In 1862, the province of British Burma was formed, and the capital moved to Yangon.

In 1911, Hanthawaddy was described as a district in the Bago division of Lower Burma. It lay in the home district of Yangon, from which the town was detached to make a separate district in 1880. It had an area of 3,023 square miles

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[6] *https://myanmars.net>travel*

(7,830 km^2), with a population of 48,411 in 1901, showing an increase of 22% in the past decade. Hanthawaddy and Hinthada were the two most densely populated districts in the province.

Hanthawaddy, as it was constituted in 1911, consisted of a vast plain stretching up from the sea between the mouth of the Irrawaddy River and the Bago Range. Except the tract of land lying between the Bago Range on the east and the Yangon River, the country was intersected by numerous tidal creeks, many of which were navigable by large boats and some by steamers. The headquarters of the district was in Rangoon, which was also the sub-divisional headquarters. The second sub-division had its headquarters at Insein, where there were large railway works. Cultivation was almost wholly confined to rice, but there were many vegetable and fruit gardens. Today, Hanthawaddy is one of the wards of Bago city.

3.2 Location, Size and Area

Bago region is located in the southern central part of the country, it is bordered by Mandalay and Magway Regions and the Union Territory of Nay Pyi Taw to the north, Mon and Kayin States and the Andaman Sea to the east, Yangon Region to the south and Ayeyarwaddy Region and Rakhine State in the west. It is located between North Latitude 16° 47' and 19° 20' and East Longitute 94° 35' and 97° 10'. Bago Region occupies an area of 15, 214 square miles (39400km) divided in four districts of Bago, Taunggoo, Pyay and Tharrawaddy. Bago is the fourth largest town of Myanmar. Bago region lies on Yangon-Mandalay High way and Yangon-Mandalay railway. Communication and transportation is an important to develop economically. Therefore, it lies on the strategic point for commodity flows. The Ayerwaddy River flows in the western part, and the Sittaung River in the east. Therefore, it has enough water resources for agriculture sector.

3.3 Land Utilization for Agriculture Sector in Bago Region

The land area of Bago Region is estimated to be approximately over 973,700 acres in 2016-2017, in which the net sown are in that year was only about 3,205,000 acres, it is about 33% of the total land area. Land utilization in Bago Region can be estimated from table during the study period from 2007 to 2017. The land use of Bago Region can mainly be classified in to four types. They are cultivable waste land, Agricultural land, Forest land and other. Agricultural land can be classified in to two

types which net sown area and fallow land. Other includes urban and rural reside entail areas, industrial land, land under water bodies that river, steam, lakes and ponds.

The net sown area in 2007-2008 had been 3,291,000 acres and the net sown area in2016-2017 was only about 32,305,000 acres so that 86,000 acres had decreased over ten year period. Fallow land is decreased from 7,000 acres to 500 acres. Cultivable waste land is slightly down trend. Reserve forest land is decreased. By contrast, other land is gradually rise upward trend.

Table (3.1) Land Utilization for Agriculture in Bago Region

(Acres)

Year	Net Sown Area	Fallow Land	Cultivable Waste Land	Reserved Forest	Other Forest Area	Other Land	Total
2007-2008	3,291	7	230	4,000	231	1,978	9,737
2008-2009	3,301	8	231	4,000	226	1,971	9,737
2009-2010	3,312	5	225	3,999	222	1,974	9,737
2010-2011	3,312	5	228	3,950	219	2,022	9,737
2011-2012	3,310	9	215	3,950	215	2,038	9,737
2012-2013	3,315	8	211	3,950	213	2,049	9,737
2013-2014	3,254	7	213	3,937	201	2,125	9,737
2014-2015	3,291	6	213	3,928	193	2,116	9,737
2015-2016	3,323	5	181	3,910	190	2,127	9,737
2016-2017	3,250	5	165	3,918	197	2,247	9,737

Source: Settlement and Land Record Department

3.4 Major Agriculture crops in Bago Region

In Bago Region, the agriculture sector has been playing a major role in the economic development. Bago Region is a vest agricultural area which specializes in rice farming. The agro-ecological situation is most favorable not only for the farming alone but also for other important crops like groundnuts, sesamum, pulses, sugar cane, cotton and maize.

Table (3.2) Major Agriculture Crops in Bago Region (2016-2017)

No	Crops	Sown Area (Thousand/Acres)	Production (Thousand/ Baskets)
1	Rice	2,937	210,780
2	Groundnut	191	11,934
3	Sesamum	170	1794
4	Sunflower	0.5	10
5	Matpe	1,293	25,563
6	Pedisein	559	11,947
7	Sugar cane	72	1,098
8	Cotton	4	2,613
9	Pesingone	18	306
10	Maize	11	608

Source: Ministry of Agriculture and Irrigation Department, Bago Region

Table (3.2) shows the sown acreage and production of major crops in Bago Region (2016-2017). The cultivation and production of rice is the largest. The second largest cultivation and production is Matpe. The cultivation and production of sunflower is the least in Bago Region.

3.5 Utilization of Farm Machineries in Bago Region (2016-2017)

Agricultural mechanization was introduced in 1970 to encourage the department of agricultural sector, and at present, the combined number of tractors being put in use by the Agricultural Mechanization Department. Their use has been mainly confined to pre monsoon and monsoon crops and the utilization of tractors is still relatively low.

Table (3.3) Utilization of Farm Machineries in Bago Region (2016-2017)

Types of Machinery	Number
Tractor	3,887
Mini Tractor	54,454
Seeder	23
Combine Harvester	595
Paddy Reaper	326
Paddy Dryer	5,840
Water pump	18,472

Source: Agricultural Mechanization Department, Bago Region

In Bago Region, among the farm machineries, Mini tractors are the most utilized. Water Pump is the second most utilized. Seeder is the least used machine. The utilization of various farm machineries by the farmers in 2016-2017 is reported in Table (3.3).

CHAPTER (IV)

PRODUCTION OF GROUNDNUT IN BAGO REGION

4.1 Groundnut Production in Myanmar

There are various types of oilseed crops, requirement conditions for oilseed crops also may be different. But all crops can be grown in all growing season. In the dry zone of Central Myanmar, Magway, Mandalay, Sagaing, and Bago Divisions are the most cultivating region of oilseed crops.

Groundnut grows best in deep, well-drained soils with a sandy or very loose surface layer. The moisture of oil, soil- texture, loose, friable sandy-loam soil types is the best for groundnut crops.

Groundnut can be grown in both the monsoon and the winter season. Mandalay, Magway and Sagaing Division and Shan State are the major monsoon groundnut growing area. Winter groundnut is grown as a second crop after sesamum in Upper Myanmar in September. On allowed soil, October and November planting is the best. In Lower Myanmar groundnut is grown after paddy.

The most grown varieties of groundnut in Myanmar belongs to the Spanish type, which is characterized by the present to about 4 to 5 primary branches borne at the base of the plant, upright growth habit and sequential flowering. Since 1920, small Spanish and big Spanish have been grown in Myanmar.

Climate

Groundnut is a subtropical crop thriving of sunshine and high temperature. The colody weather at flowering also reduces the number of fruit sets. Groundnut grows best below 1250mm, although specific varieties can be found suitable for much higher elevations. Generally, the bunch types tend be more severely affected by climate variation within their normal range, and the runner types least.

The groundnut crop requires of least 120 days from emergence to harvested groundnut is fairly drought resistant once established. This tolerate flooding for up to 1 weeks provided the water subsequently drains away quickly. A rainfall range of 500-1000 mm will allow for commercial groundnut production, but a crop can be produced on as little as 300-400 mm, Higher rainfall may produce extra top growth but not necessarily more seed. A temperature range of 25°C-30°C appears to be the optimum, between 20°C retards development, and above 35°C adversely affects flower production.

Soil

The ideal soil for groundnut has been identified as well-drained, light-colored, loose friable, sandy loam, well supplied with calcium and a moderate amount of organic matter. Sandy and loamy soils are more suitable than clay, since they are more easily penetrated by roots and pegs, and allow easier percolation of rainfall. Groundnut is grown during wholly manual and clayey soil is not suitable because of harvesting losses. Groundnut grows best in slightly acid oils with a pH of 6.0-6.5. A pH of 5.0 would appear to be within the tolerance climate-saline soil are unsuitable for groundnut, which has a very low salt tolerance.

4.2 Types of Groundnut

Although peanuts come in many varieties, there are four basic market types: Runner, Virginia, Spanish and Valencia. Each of the peanut types is distinctive in size, flavor, and nutritional composition.[7]

Within each four basic types of peanuts, there are several "varieties" for seed and production purposes. Each variety contains distinct characteristic which allows a producer to select the peanut that is best suited for its region and market.

Runner

Runners have become the dominant type due to the introduction in the early 1970's of a new runner variety, the Florunner, which was responsible for a spectacular increase in peanut yields. Runners have rapidly gained wide acceptance because of the attractive, uniform kernel size. Fifty-four percent of the runners grown are used for peanut butter. Runners are grown mainly in Georgia, Alabama, Florida, Texas and Oklahoma.

Virginia

Virginias have[8] the largest kernels and account for most of the peanuts roasted and processed in-the-shell. When shelled, many of the larger kernels are sold as gourmet snack peanuts. Virginias are grown mainly in southeastern Virginia, northeastern North Carolina and South Carolina.

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[7] *www.berkelewellness.com>food*

Spanis

Spanish-type peanuts have smaller kernels covered with a reddish-brown skin. They are used predominantly in peanut candies, with significant quantities used for snack nuts and peanut butter. They have a higher oil content than the other types of peanuts which is advantageous when crushing for oil. They are primarily grown in Oklahoma and Texas.

Valencia

Valencia usually have three or more small kernels to a pod and are covered in a bright red skin. They are very sweet peanut and are usually roasted and sold in the shell. They are also excellent for fresh use as a boiled peanut. New Mexico is the primary producer of Valencia peanuts.

4.3 Groundnut Production in Bago Region

The major oil crops from which edible oil is extracted in Myanmar comprise of Groundnut, Sesamum, Sunflower, Niger and oil palm. In Bago Region the major oilseed crops is groundnut. Groundnut is a commercial crop not only for farmers but also for the country. Table 4.4 shows the production of groundnut in Bago Region during the period of the study.

Table (4.1) Total Groundnut Production in Bago Region (2007-2008 to 2016-2017)

Year	Sown Acres (Thousand/Acres)	Production (Thousand/Tons)	Yield (Thousand/Acres/Tons)
2007-2008	162	9,693	0.059
2008-2009	173	10,732	0.062
2009-2010	187	11,709	0.063
2010-2011	190	11,937	0.063
2011-2012	184	11,179	0.061
2012-2013	194	12,014	0.062
2013-2014	196	12,207	0.062
2014-2015	197	12,390	0.063
2015-2016	196	12,141	0.062
2016-2017	191	12,013	0.063

Source: Ministry of Agriculture and Irrigation Department, Bago Region

According to the study of sown acreage, yield and production in Bago Region within 10 years, the yearly average acres were 1,873,406 acres and the average baskets were 116,019,308 baskets are shown in table (4.1).

The sown acres of groundnut in Bago Region was 162 Thousand Acres in 2007-2008 and then it increased to 173 Thousand Acres in 2008-2009.And it increased again to 190 Thousand Acres in 2010-2011.And then it declined to184 Thousand Acres in 2011-2012.In 2012-2013, 2013-2014 and 2014-2015, it was increased and then decreased to 2016-2017. The production of groundnut was mainly due to the fluctuation of sown acres during the study period. The minimum sown acres were 162 Thousand Acres and the maximum was 196 Thousand Acres.

The production of groundnut was 9693 Thousand Tons in2007-2008. Then it then it increased to 10732 Thousand Tons in 2008-2009.And it increased again to 11937 Thousand Tons in 2010-2011. In 2012-2013, 2013-2014 and 2014-2015, it was increased again and then decreased continuously down to 2016-2017.

In Bago Region there was increased yield per acres. The minimum yield per acres was 0.059 Thousand Tons/Acres and the maximum was 0.063 Thousand Tons/ Acres. Both sown acreage and production of groundnut depend upon the quality of seeds, fertilizers, and agro-chemical. The Production declined due to lack of

incentives as well as other factors such as unfavorable weather and lack of success in the introduction of technical innovation.

4.4 Groundnut Production in Four Districts of Bago Region

Groundnut is grown in almost every township in Bago Region. They are Taunggoo, Yedashe, Kyaukkyi, Pyu, Htantabin, Oktwin townships in Taunggoo District, Bago, Thanatpin, Waw, Naunglebin, Kyauktaga, Daik-U, Shwegyin townships in Bago District.Pyay, Paukkaung, Paungde, Pandaung, Thegone, Shwedaung townships in Pyay District; Tharrawaddy, Letpadan, Minhla, Okpho, Zigon, Nattalin, Monyo, Gyobingauk townships in Tharrawaddy District.

Pyay District is the top-most groundnut cultivation district in Bago Region and 65,922 cultivating acres were used to grow groundnut in 2007-2008.It has been producing 3,922,861 baskets in table (4.2). In 2016-2017, the cultivating acres increased to 85,457 and 5,217,113 baskets were produced because of high yield.

Bago District is the second-most groundnut cultivating acres grown in 2007-2008. In table (4.2), 42,353of cultivating acres were grown and 2,774,520 baskets were produced. In 2016-2017 only 51,069 of cultivating acres were grown, due to high yield 3,623,748 baskets could be produced.

Taunggoo District is the third-most groundnut cultivating district in Bago Region. In 2007-2008, 28,972 of cultivating acres were grown and 1,576,700 baskets were produced (Table 4.2). In 2016-2017, the cultivating acres increased to 37,448 and 2,245,449 baskets could be produced because of high yield.

Tharrawaddy District is the least groundnut cultivating district in bago Region. In 2007-2008, about 24,993 of cultivating acres were grown and 1,419,532 baskets were produced (table 4.2). In 2016-2017, the cultivating acres obviously decreased to 17,220 and 927,325 baskets could be produced due to high yield.

Table (4.2) Groundnut Production and Cultivation in four districts of Bago Region (Comparing 2007-2008 and 2016-2017)

No	District	Acreage(Acres)		Production(baskets)	
		2007-2008	20016-2017	2006-2007	2016-2017
1	Taunggoo	28,972	37,448	1,576,700	2,245,449
2	Bago	42,353	51,069	2,774,520	3,623,748
3	Pyay	65,922	85,457	3,922.861	5,217,113
4	Tharrawaddy	24,993	17,220	1,419,532	927,325
Total		162,240	191,194	9,693,613	12013,635

Source: Ministry of Agriculture and Irrigation Department, Bago

Table (4.2) shows the production baskets and cultivation acres of each district in 2007-2008 and 2016-2017.Taunggoo, Pyay, Bago increased production baskets and cultivated acres but Tharrawaddy has shown declining output and cultivated area.

Table (4.3) Groundnut cultivation acres in Four Districts of Bago Region (2007-2008 to 2016-2017)

(Acres)

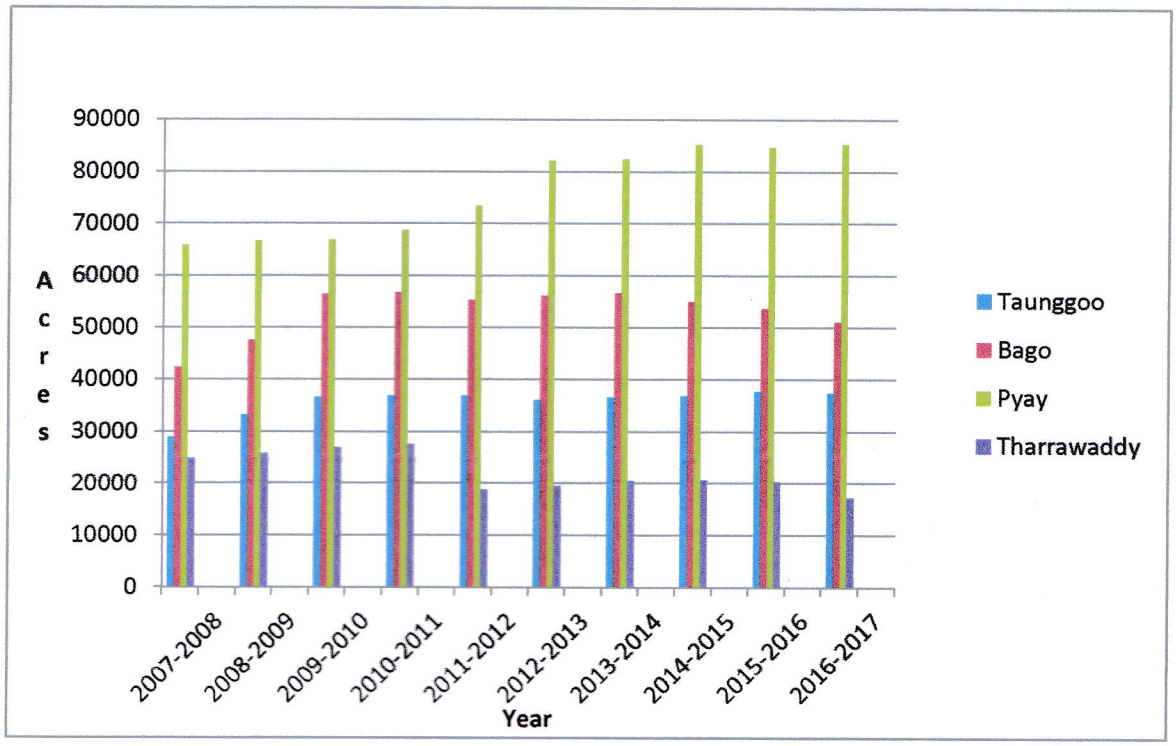
Year	Taungoo	Bago	Pyay	Tharrawaddy	Total
2007-2008	28,972	42,353	65,922	23,993	164,420
2008-2009	33,231	47,560	66,710	25,568	173,364
2009-2010	36,671	56,424	66,974	26,951	187,030
2010-2011	36,983	56,766	68,778	27,602	190,127
2011-2012	36,973	55,328	73,477	18,775	184,553
2012-2013	36,157	56,132	82,258	19,545	194,092
2013-2014	36,641	56,609	82,583	20,590	196,423
2014-2015	36,873	54,970	85,314	20,751	197,908
2015-2016	37,807	53,619	84,747	20,300	196,473
2016-2017	37,448	51,069	85,457	17,220	191,194

Source: Ministry of Agriculture and Irrigation Department, Bago Region

Table 4.3 shows the increase and decrease of yearly groundnut cultivating acres in respective districts in Bago Region from 2007-2008 to 2016-2017. Taunggoo and Pyay increased continuously from 2007-2008 to 2016-2017.Tharrawaddy

decreased continuously from 2007-2008 to 2016-2017. Bago increased continuously from 2007-2008 to 2013-2014 but decreased from 2014-2015 to 2016-2017.

Figure (4.1) Groundnut cultivating acres in Four Districts of Bago Region (2007-2008 to 2016-2017)



Source: Ministry of Agriculture and Irrigation Department, Bago Region

Composition of groundnut in Bago Region is shown in Table (4.3). In the past, cultivated area in Bago, Taunggoo, Pyay have increased continuously from 2007-2008 to 2016-2017 but Tharrawaddy declined continuously from 2007-2008 to 2016-2017.

Table (4.4) Groundnut Production in Four Districts of Bago Region (2007-2008 to 2016-2017

(Baskets)

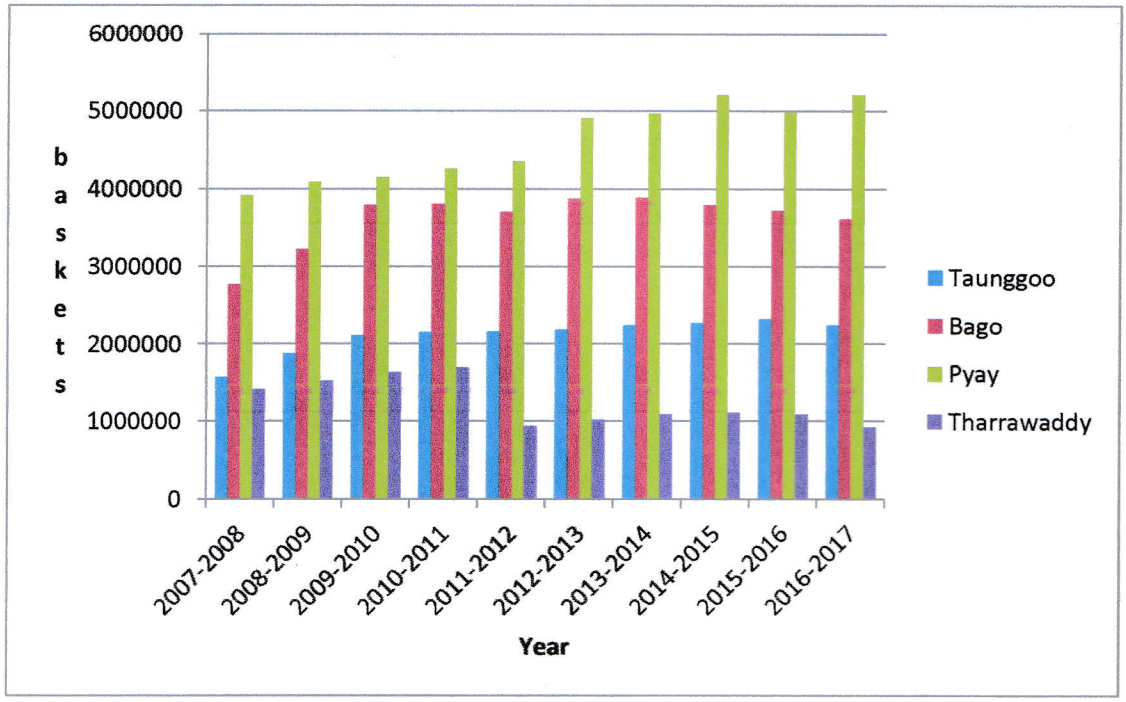
Year	Taunggoo	Bago	Pyay	Tharrawaddy	Total
2007-2008	1,576,700	2774520	3922861	1419532	9693613
2008-2009	1,881,681	3223172	4096824	1530383	10732060
2009-2010	2,112,498	3,798,476	4,159,346	1,639,671	11,709,991
2010-2011	2,156,278	3,814,561	4,268,321	1,698,143	1,193,7303
2011-2012	2,162,000	3,713,903	4,361,060	942,290	11,179,253
2012-2013	2,184,852	3,886,086	4,918,779	1,024,703	12,014,420
2013-2014	2,243,272	3,900,173	4,974,601	1,089,435	12,207,481
2014-2015	2,267,401	3,799,040	5,216,379	1,107,399	12,390,219
2015-2016	2,322,109	3,733,474	4,997,179	1,088,571	12,141,333
2016-2017	2,245,449	3,623,748	5,217,113	927,325	12,013,635

Source: Ministry of Agriculture and Irrigation Department, Bago Region

Table 4.4 shows the increase and decrease of yearly producing groundnut baskets in respective districts in Bago Region from 2007-2008 to 2016-2017. Taunggoo increased continuously from 2007-2008 to 2015-2016 but decreased in 2016-2017. Tharrawaddy decreased continuously from 2007-2008 to 2016-2017. Bago increased continuously from 2007-2008 to 2013-2014 but it can be seen a decline from 2014-2015 to 2016-2017. Pyay was increased continuously from 2007-2008 to 2014-2015 and decreased in 2015-2016 and then increased again in 2016-2017. It was also because of the rising prices of groundnut in response to the growing demand and encouragement of the government to grow more groundnut as a projected crop.

Figure (4.2) Groundnut Production in Four Districts of Bago Region (2007-2008 to 2016-2017)

(Baskets)



Source: Ministry of Agriculture and Irrigation Department, Bago Region

Composition of groundnut in Bago Region is shown in Table (4.4). In the past, cultivated area in Bago, Taunggoo, Pyay have increased continuously from 2007-2008 to 2016-2017. Tharrawaddy increased continuously from 2007-2008 to 2010-2011 but declined continuously from 2007-2008 to 2016-2017.

4.5 Harvest price of Groundnut

Harvest price is the price level that the farmers receive at the farm gate at the harvest time. In connection with price changes, as mentioned above, changes are taking place, due to changes of production cost. The price differed from district to district depending on the quality of local groundnut and on the distance from the ports where they may be sold for export. Groundnut can be obtained in two colors in Myanmar. These colors are the white and red brown in the domestic market in two seasons.

Table (4.5) Harvest price of groundnut in Two Seasons (2007-2008 to 2016-2017)

(Kyat per Ton)

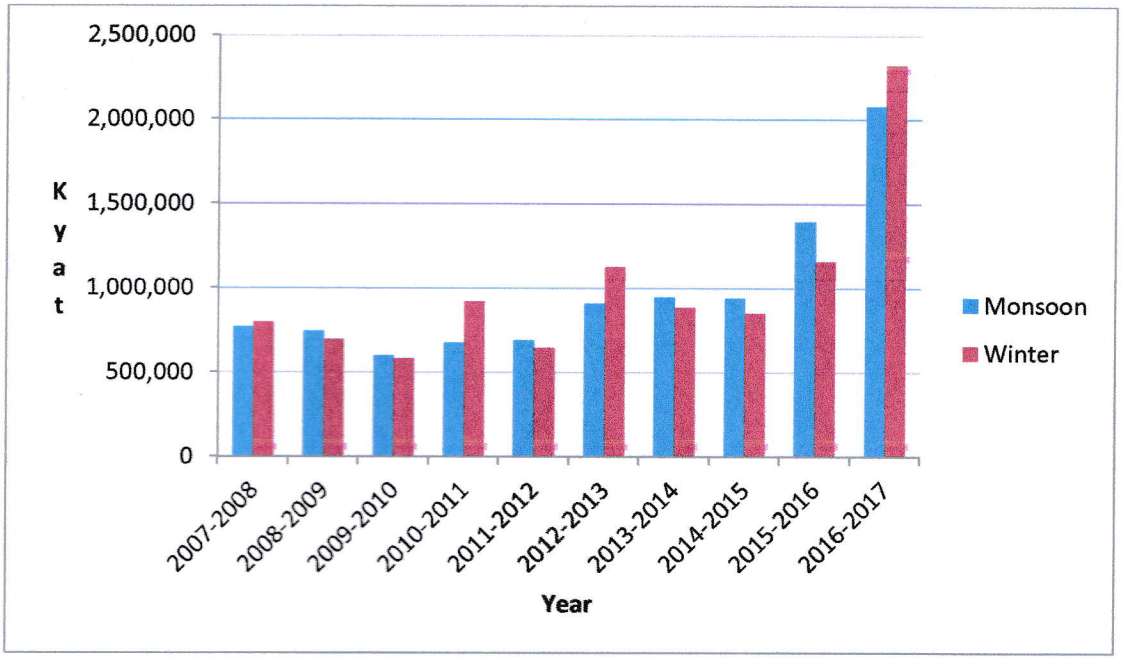
Year	Monsoon	Winter
2007-2008	768,769	798,337
2008-2009	743,681	697,089
2009-2010	598,528	582,400
2010-2011	674,791	920,651
2011-2012	689,164	645,955
2012-2013	906,717	1,127,768
2013-2014	944,901	884,318
2014-2015	938,739	850,483
2015-2016	1,392,969	1,159,984
2016-2017	2,075,942	2,325,478

Source: Ministry of Agriculture and Irrigation Department, Bago Region

In monsoon season, the harvest price of groundnut has been falling from 768,769 (Kyats per ton) in 2007-2008 to 689,165(Kyats per ton) in 2011-2012. In 2010-2011, 2011-2012 and 2012-2013, the harvest price of groundnut has been rising from 674,791 (Kyats per ton) to 938,739 (Kyats per ton). Its harvest price jumped nearly twice in 2016-2017, compared with those of 2015-2016. Monsoon season crop can be damaged if there is drought or heavy rain.

In winter season, the harvest price of groundnut has been falling from 798,337 (Kyats per ton) in 2017-2008 to 645,966 (Kyats per ton) in 2011-2012. In 2012-2013, the harvest price of groundnut has increased to 1,127,768 (Kyats per ton). From 2013-2014 to 2014-2015, the harvest price of groundnut has decreased again to 850,483 (Kyats per ton). In 2009-2010, the price of groundnut was decreased due to lack of incentives as well as other factors such as unfavorable weather. In 2016-2017, the price increased twice of that previous period .The price increase over the past year is not primary due to these factors but to a significant growth in Chinese demand.

Figure (4.3) Harvest price of groundnut in Two Seasons (2007-2008 to 2016-2017)



Source: (Table 4.5)

The harvest price of groundnut in two seasons is mentioned in table (4.5). Myanmar, the price of groundnut is varied among monsoon and winter .In the study, the price of groundnut in two seasons has gradually fluctuated. The prices of groundnut have increased continuously from 2010-2011 to 2016-2017.

CHAPTER (V)
CONCLUSION

5.1 Findings

Myanmar's economic system has shifted from a central of planned economy to a market oriented economy since 1988-1989, the agricultural sector of the country corresponding reflects the impact of economic reforms in its own right. With the transformation of centrally planned economy to market oriented one, farmers are allowed to grow any crop of their choice. Moreover, the product can also be freely stored, processed and traded.

Groundnut fills a number of role in Myanmar's society, and it is used as a flavoring in some foods and as an oil for cooking, some of which is sold for export. The byproduct from oil production, oil cake, is also used as feed for livestock and fish farms. Growing groundnut is one of the income sources for farmers. Groundnut is mainly grown in dry zone of Myanmar because of weather and soil, therefore to grow is should be encouraged in other relevant regions and states.

Bago region has its own potential of growth and important in the Myanmar economy. Given it economic structure, its economic growth is determined by its own agricultural development. It important role in agriculture is determined by natural resources, which provide a comparative advantage. It can be expected that this situation will persist in the future because here is ample scope for increase in groundnut yields, so that output can still grow.

In Bago Region, sown acreage and production of groundnut were gradually increased. Increasing of groundnut sown acreage and production of groundnut are based on farmers, technology, uses of fertilizers. The production of groundnut was more increased than the past year in Bago Region. In Bago Region, Pyay district is the largest production area and Bago district is the second and Taunggoo district is the third and Tharrawaddy district is the least.

The price of groundnut becomes more attractive to the cultivaters. During the period under study, the price of groundnut in monsoon and winter are increased year by year. Because Bago Region is a good cultivated region, the yields of groundnut have good result. And then, the proper weather conditions favor the groundnut to grow in all reasons. The yields of groundnut considerably increased between 2007

and 2017. Since groundnut is the main source of domestic consumption, Bago Region plays an important role in Myanmar economy.

5.2 Suggestions

In Bago Region, farmers need agricultural inputs Such as land, irrigation, machinery, technology, quality seeds, fertilizers and other inputs in order to increase the productivity of the region. Groundnut is an important of agricultural crop in Bago Region and according to the study, it has suggest that the important role for agriculture sector to emphasize in the production of groundnut because they are marketable agricultural product which can earn foreign exchange.

Among oilseed crops, groundnut is the most important oilseed crop. Since consumer prefers groundnut oil, they are ready to pay sufficient margin of higher different price for groundnut oil. By increasing groundnut productivity, the farmer would get more yield and income.

If the total cultivatable waste land can be turned in to cultivated lands, it is indeed totally unnecessary even to mention how much good it will do for the advantage of the region and the people. The use of more organic fertilizers should be encouraged in order to promote agricultural yields and hence production. The government and private sector should provide necessary technology, infrastructure and various finance sources for increasing the productivity of farmers and quality of groundnut.

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APPENDIX


Runner
Virginia
Spanish
Valencia

Myanmar Information Management Unit

District Map - Bago Region

Disclaimer: The names shown and the boundaries used on this map do not imply official endorsement or acceptance by the United Nations.