

Geographic Study on Asparagus Cultivation of Hinthada Township

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Abstract

This paper tried to present Asparagus cultivation from the geographical point of view. Hinthada Township is located in the deltaic area and nearly 70 percent of the population lived in rural area in which agriculture is major economy of the area. Asparagus is a perennial crop that is mainly cultivated in Hinthada Township. Although asparagus cultivation gives high economic return, most people do not cultivate it due to high investment. As it is a perennial crop, local people do not get economic return within a year. It is a major problem in Asparagus cultivation. It does not need much chemical fertilizer but irrigation is necessary for the successful plant growth. Demand is high due to its health benefit. It is sent to Yangon, Patheingyi, as well as Hinthada Town. Like other crops, price fluctuates temporally. In peak harvesting period, price is some extent low because of high supply. The objectives of the paper are to understand methods of cultivation on asparagus cultivation, to explore good points and weak points of asparagus cultivation and to find out the net return of asparagus cultivation affecting local people's economy in Hinthada Township. To present the paper, primary data was mainly used and quantitative qualitative mixed method was applied.

Keywords: asparagus cultivation, ownership, labour cost, fertilizer uses, marketing system, price

Introduction

Edible portion of green asparagus contains 92 percent of water, 2.8 percent of protein, 2.2 percent of carbohydrate, 0.2 percent of fat, calcium, folic acid, calcium, vitamin B1, vitamin B2, vitamin B3, vitamin C and vitamin E, etc. and it should be eaten to get good health (Ong, 2015).

Asparagus is a perennial crop meaning it will come back year after year on its own and that is harvested once per year over an 8 to 12 weeks period. Asparagus plants are usually grown in a traditional garden. Most asparagus plants have a 10 year life expectancy. Asparagus is a very healthy vegetable that has several good properties. It has high folic acid content.

Asparagus can be successfully grown in temperate climate with the temperature between 18° and 29° C. It is cultivated through direct seeding, transplanting, and greenhouse grown seeding. Ideal pH value is between 6.5 and 7.5 and acid condition (pH more than 6.5) reduces growth and yield (Aegerter, *et. al.*, 2012).

In Myanmar, asparagus is also low in calories and is very low in sodium. It is good for health. It is fresh and of excellent quality. Although asparagus cultivation is uncommon in Myanmar, demand is high because of health benefit. In Yangon, most of the consumers become aware of the importance of health and they try to get food that support human health. Therefore, demand of asparagus is high and Yangon is a major market area for asparagus.

In Ayeyarwady Region, asparagus cultivation is extensively found in Hinthada Township only. It gives high rent return but it needs much investment. Although growers want to cultivate it extensively, they possess low investment. Demand and price is high due to low supply caused by limited cultivated area. In asparagus cultivation, poor drainage and shades of the trees are major problems affecting plant growth.

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In Hinthada Township, cultivated area of asparagus is small although demand is high. Therefore, Hinthada Township was selected as study area to present asparagus cultivation from geographical point of view.

Study area

Hinthada Township is located in the northern portion of Ayeyarwady Region. It is situated on the deltaic plain that is very suitable for paddy cultivation because of alluvial soils. The total area of the Hinthada Township is 980.81 square kilometers (378.695 square miles). In 2016, total population was 338253 persons and urban population was 28 percent and rural population 72 percent of total population. Rural population engaged in agriculture and crop cultivation is one of the major economic activities in Hinthada Township (Pann Ei Phyu, 2018). Existing garden land supports asparagus cultivation in Hinthada Township.

Research Question

Why is asparagus cultivation is dominant in Hinthada Township?

How does asparagus cultivation affect local people's economy in Hinthada Township?

The aim of the paper is:

- to share the knowledge on asparagus cultivation for the purpose of extending asparagus cultivated area

Objectives:

- to understand methods of cultivation on asparagus cultivation
- to explore good points and weak points of asparagus cultivation
- to find out the net return of asparagus cultivation affecting local people's economy in Hinthada Township

Data and methodology

Primary data such as cultivation period, input, price, market, etc. were collected through field observation and semi-structure questionnaires. Three village tracts: Kettuyway, Thingankwin and Thonepinsai were selected as sample areas due to extensive asparagus cultivation and 15 questionnaires were distributed to households. Three interviews and 10 phone interviews were done with asparagus cultivators to get detailed understanding on asparagus cultivation.

Secondary data were also used to present asparagus cultivation in Hinthada Township. Geographical methods and quantitative-qualitative mixed method were applied to illustrate asparagus cultivation.

Background of Hinthada Township

Hinthada Township located in the northern portion of Ayeyarwady Region lies between North latitudes 17° 26' and 17° 48' and also between East longitudes from 95° 11' and 95° 33'.

The total area of the Hinthada Township is 980.81 square kilometers (378.695 square miles). It is made up of 21 wards and 103 village tracts that include 820 villages (Figs. 1 & 2). The shape of the township is fairly compact in shape.

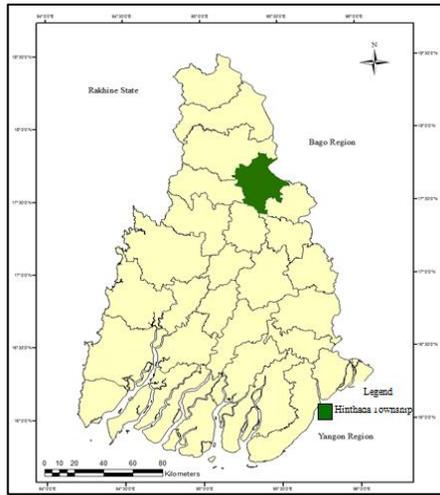


Figure (1) Hinthada Township in Ayeyarwady Region. (Source: Agriculture Atlas, 2002)

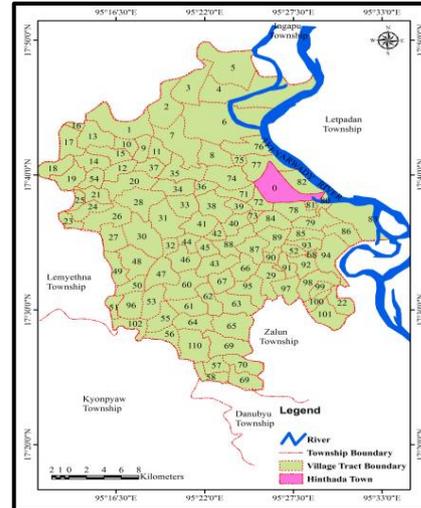


Figure (2) Wards and Village Tracts of Hinthada Township. (Source: General Administrative Department, Hinthada)

Relief is characterized by low lying flat alluvial plain. This township has a large low-lying plain with the mean elevation of more than 10 m (44.3 feet) above sea level which is suitable for paddy cultivation. Ayeyarwady River is the most important river in this township, followed by Ngawun River. These rivers serve as the township boundary and are prominent drainages. Other small streams are Natmaw and Daga. In the dry period, water is irrigated from these rivers and summer paddy is cultivated.

The study area has monthly mean temperature of 27.4°C during the period from 2006 to 2018. April is the hottest month and January is the coldest month. In April, the maximum temperature is 38.25°C and minimum temperature 13.75°C in January, thus the range of temperature is 24.5°C. Due to its locational position, it usually receives the southwest monsoon rain and the average total rainfall is 2252.71 mm in 2017 (Fig. 3).

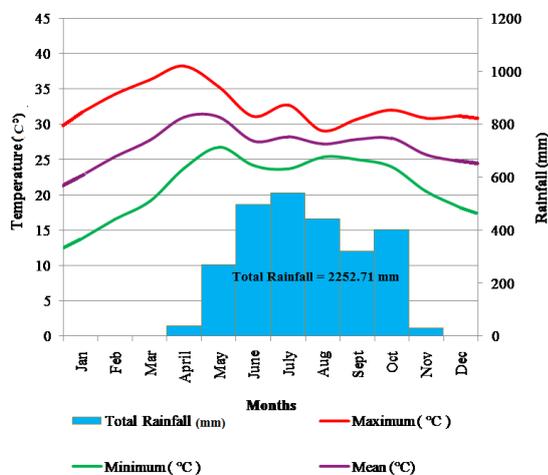


Figure (3) Climograph of Hinthada Township. (Source: Data based on Meteorology and Hydrology Department, Hinthada)

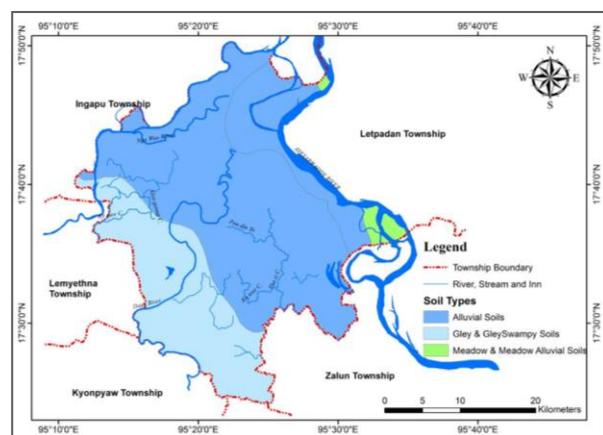


Figure (4) Soils of Hinthada Township. (Source: Data based on Meteorology and Hydrology Department, Hinthada)

The soil types of Hinthada Township are Alluvial Soils (Fluvisols), Gley and Gley Swampy Soils (Humic Gleysols), Meadow and Meadow Alluvial Soils (Gleysols) and Alluvial Soils (Fluvisols). These soils support crop cultivation of Hinthada Township (Fig. 4).

Existing physical conditions are suitable for asparagus cultivation. Total population was 338253 persons in 2016 and the total population increases in Hinthada Township year by year due to the natural increases and immigration. Urban population was 28 percent and rural population 72 percent of total population. Agriculture is a main economy of Hinthada Township and most people are engaged in agricultural activities.

Results and Findings

Asparagus Cultivation

Although most cultivators use asparagus eggs in cultivation, it can also be cultivated by using seeds. Most cultivators in Hinthada Township buy asparagus eggs from other cultivators who cultivated more than 10 years because the number of eggs increases yearly. It is mainly grown on garden land and cultivated area of asparagus is extensively found in Kanyut, Kettuyway, Thingankwin and Thonepinsai (Fig. 5).

Cultivation period

Asparagus is a perennial crop and cultivation is started at the end of February or at the beginning of March. But, some farmers start asparagus cultivation in January as they want to produce it early for the purpose of getting higher price (Fig. 6). The leaves of the asparagus are cut in the field and burnt when the leaves are dry (Fig. 7). Then, about 10 days later, the sprout comes out and it is necessary to irrigate water and paddy husks are used to cover the roots of the plant for the purpose of maintaining moisture in the soil. About 40 days later, it is ready to be cut (Figs. 8, 9 & 10).

Irrigation

Irrigation is needed in asparagus cultivation for the purpose of refilling the moisture loss through evaporation and to leach the salt in the soil. In Hinthada Township, it is necessary to get irrigation water at least 2 or 3 times in the cultivation periods to be successful cultivation.

Cultivated Area Ownership

According to questionnaires' results, 55 percent of the cultivators own less than 1 acre of asparagus cultivated area and 27 percent 1 acre (Fig. 11). It shows that most cultivators grow asparagus on small plots of land because of high investment. Growers need about 100,000 ks per acre as investment. Moreover, it does not give economic return within 2 years. Although cultivators get much economic return in later years through asparagus cultivation, they do not get return at the starting period within a year. It is a major difficulty for the cultivators because they do not have much investment and interest rate is high.

Land preparation for Asparagus cultivation

According to questionnaires' results, 9 percent of the cultivators prepared the land once per 3 years and again cultivate eggs of asparagus to increase production and to get large asparagus and 91 percent of the grower prepare the land once per more than 10 years. It depends on investment of the farmers. Farmers do not get return within 2 years after

cultivation. Therefore, most growers reclaim the land once per ten years for the purpose of getting regular return (Fig. 12).



Figure (5) Asparagus eggs



Figure (6) Asparagus plants in the rainy period



Figure (7) Aafter leaves of Asparagus are cut and burnt



Figure (8) Asparagus sprout comes out



Figure (9) Asparagus plants



Figure (10) Plucking Asparagus

Labour cost

In the peak period of harvesting, labour requirement is important. Asparagus is harvested about one and half month. Although they used family members in cultivation and weed removing, labour is unavoidably rent in harvesting period for the purpose of finishing before rain. For an acre of asparagus cultivation, 4 labours are needed and labour cost is 4000 ks per day. Total labour cost is about 400,000 ks for a harvesting period.

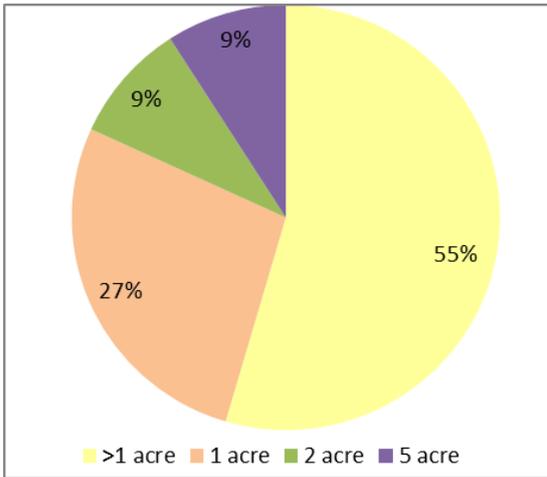


Figure (11) Cultivated Area Ownership in Asparagus cultivation. (Source: Questionnaires’ answer)

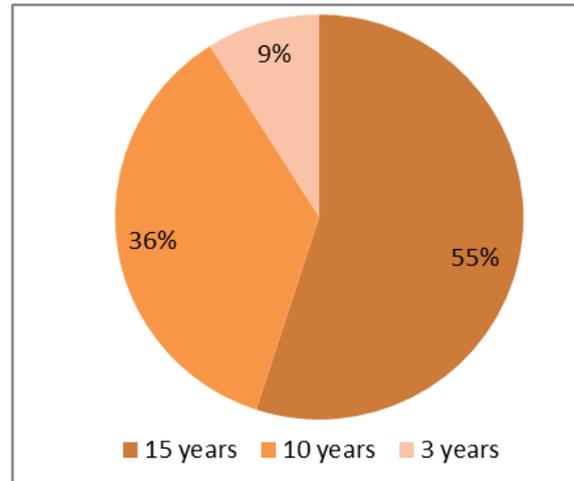


Figure (12) Land preparation period for Asparagus cultivation. (Source: Questionnaires’ answer)

Fertilizer uses

In asparagus cultivation, chemical fertilizers: Armo fertilizer, Compound (N, P, K) fertilizer, Urea, etc. and natural fertilizers such as cow dung, by products of Matpe, are mainly used (Table 1 & Fig. 13).

Table (1) Fertilizer uses in Asparagus Cultivation (2018). (Source: Questionnaires’ results)

	Number of grower	Percent
Natural and chemical fertilizer	25	46
natural fertilizer	15	27
Chemical fertilizer	15	27

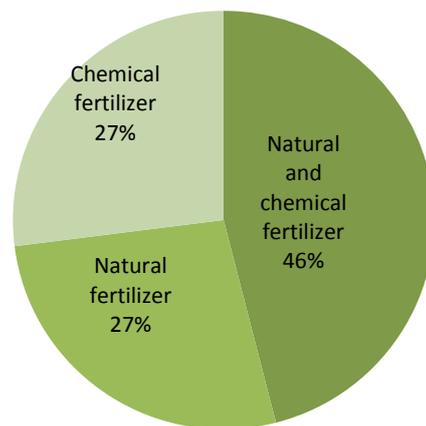


Figure (13) Fertilizer uses in Asparagus Cultivation (2018) (Source: Table)

46 Percent of the growers use chemical and natural fertilizers in asparagus cultivation to get large asparagus. 27 percent of the growers use natural fertilizers and it is better for health.

Unlike other crop cultivation, growers use small amount of fertilizer in asparagus cultivation and input cost is low.

Flows of Asparagus

According to questionnaires results its and interviews, most asparagus are sent to Yangon Region, a major market area because of demand. Another market area is Pathein Township. Near to Pathein is major advantage in flow of asparagus. Hinthada Market is also a major market place and some asparaguses are carried from Hinthada Market to other areas (Fig. 14). Hinthada Market is not only a wholesale area but also a retail area of asparagus.

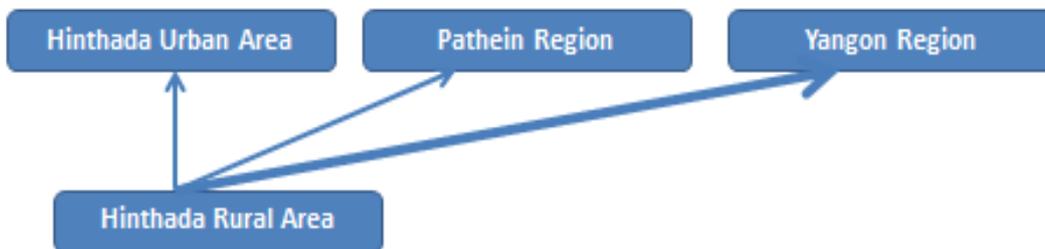


Figure (14) Major market place of asparagus. (Source: Questionnaires' results)

Marketing system and Price

Most asparaguses are bought by middlemen and sent directly to Yangon, Pathein, etc. Last 5 years ago, cultivators sent asparagus to depots of Hinthada Town. At present, middlemen come to the villages and buy asparagus. But, there is a price variation among middleman. Prepaid system for asparagus cultivation is not found in Hinthada Township.

Price is highest in early harvesting period due to the low supply. At that time, some cultivars get more than 3000 ks per viss. Then, like other crops, price gradually decreases in the peak harvesting period due to higher supply. In this period, price of asparagus is between 1000 and 1500 ks per viss. Then, price again increases to more than 1500 ks per viss at the end of harvesting period due to the low supply.

Price also varies with size of the asparagus. The bigger the size, the higher the price. According to questionnaires' results, 54 percent of the grower said the variation in price depends on size of the asparagus and 46 percent of the growers answered that price variation is mainly related to supply and demand of asparagus.

Economic return of asparagus

According to interviews, net economic return of asparagus is more than 250,000 ks per acre. In the peak harvesting period, growers harvest and sell more than 100 viss per day. Therefore, asparagus cultivation is a good economy for the growers.

Problems in asparagus cultivation

Major problem is high investment. Cultivators know that asparagus cultivation gives much economic return. But, most local people do not cultivate it because they do not have large investment.

Second problem is weed problem. When weeds consume nutrients in the soils and nutrient is less available for asparagus, the size of it becomes smaller. Thereby, the price is lower. Therefore, weed is one of the major problems. Weeds are removed twice per month for the purpose of getting large asparagus.

It cannot be cultivated in shadowed areas. Asparaguses like sunshine and it is stronger and larger in size when they get sufficient sunshine. Moreover, it cannot be cultivated in poor

drainage area. It is one of the problems that hinder asparagus cultivation. Therefore, growers cultivate it before the rainy season.

Conclusion

Asparagus cultivation gives high economic return for local people and health benefit for the consumers. But, asparagus cultivation is not extensively found in the area because poor people have low investment. Asparagus cultivation needs high investment because it costs high and it takes 2 years to get economic return to the growers. Although input cost including fertilizer cost and labour cost is not too high, the egg of asparagus is expensive and the cost is 1,000,000 ks per acre. Asparagus cultivation is not suitable in poor drainage areas and irrigation is necessary to get large asparagus. Demand is always high due to people's awareness on health benefit of asparagus. Although price fluctuation occurs, asparagus cultivation is beneficial for growers. It should be cultivated not only for economic reasons but also for health reasons. Therefore, there should be plans to extend asparagus cultivated areas as it is a productive crop cultivation in Hinthada township. It gives less risk on pests and high economic return per acre. Therefore, it is needed to support the loan for investment to local people to cultivate the crop that surely support local economy and health benefit.

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