BETEL LEAF AND BETEL QUID SHOP: ECONOMIC ACTIVITIES OF PANTANAW TOWNSHIP, AYEYARWADY REGION

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Abstract

This paper presents the geographical assessment of betel plant environment, particularly on the distribution pattern of betel leaf cultivation in Pantanaw Township. There are two species of betel leaf in Pantanaw Township such as Myaungmya species and Gwa species. Betel leaf is grown in wet and hot seasons as cash crop in the nearly all parts of Pantanaw Township. With the increasing population in the study area, more people are engaged in agriculture activities including betel leaf cultivation. Betel leave are commercial products, mainly used for chewing, besides having significant medicinal properties and ceremonial events. Although betel leaf cultivation can provide relatively sustainable income of local people in the Pantanaw Township, it can damage indirectly human health. The betel leaf cultivation and spatial distribution patterns of betel quid shops are analyzed by using ArcMap GIS 10 software and quantitative analysis.

Keywords: *Betel leaf cultivation, betel quid shop, distribution pattern, Pantanaw Township*

Introduction

Betel leaf cultivation is an important economic activity of Pantanaw Township.

Most betel leaf cultivated areas are found in Kazinngu, Bawaing, Shwekyaungmyauk, Tawchaung, Yaypawgyi and Katthawin villages.

Betel leaf has a deep green colour with heart-shape which is widely used in Myanmar. The scientific name of betel vine is *Piper betel linn*. It belongs to the family of *Piperaceae.*

There are two species of betel leaf in Pantanaw Township, as Myaungmya species and Gwa species. Betel leaf is grown in wet and hot seasons as cash crop in the nearly all parts of Pantanaw Township.

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Betel leaf is a mainly transported to Yangon and neighbouring townships such as Nyaungdon, Kyaunggon, Kyonpyaw, Danubyu, Maubin, Einme and Warkema,

Betel leaf is a commercial product, mainly used for chewing, besides having significant medicinal properties.

Betel quid made up of the betel leaf includes slices of betel nut, lime, tobacco, catechu, aniseed, liquorice, cardamom, clove, spicy materials and others.

Most betel quid consumers are automobile drivers, daily workers and other social classes. Therefore, the number of betel quid shops has increased near the main road and the streets in Pantanaw Township.

Betel quid chewing can affect staining the teeth of regular users. The red spit from chewing betel quid is prohibited in many places.

According to the released by WHO in 2014, more than half of the adults aged between 45 and 65 are being suffered with mouth cancer, essentially due to smoking and chewing betel quid, 34 persons for every 100 persons who have the habit of betel quid chewing, 22 persons who smoke and chew betel quid, 19 persons who smoke, but not chewing.

Educative talk on the danger of smoking and chewing tobacco was held at Insein General Hospital in 2014. Although 273 persons with bad habit of taking tobacco attended the forum only 33 persons could quit their bad habit. Tobacco includes various toxic materials that can cause cancer if used for a long time. Cavity cancer is most common among the males. In Southeast Asian countries 30 to 60 persons of males and 1.8 to 15.6 percent of female are either smoking or chewing betel quid with tobacco.

Research problem

Myanmar is agro-based country and most of the active workforces are engaged in agricultural activities. Although paddy is mostly grown in Pantanaw Township, betel leaf is also cultivated in some suitable lowland areas. Betel leaf cultivation can damage indirectly human health.

Since the days of Myanmar Kings, betel quid chewing has become traditional. In those days, the adverse effect of chewing betel quid was not known. People of the older generation, especially the males chewed betel quid

with a little Myanmar tobacco. With the improvement of medical science, the people realized the deadly effect of tobacco.

In Myanmar, the proportion of people chewing betel quid has been rising and the percentage is highest among the Asian countries according newspaper's information. In order to reduce the bad habit of chewing betel quid, the government and health staff discourage the people by mean of raising awareness through television, radio, journals, newspapers and other medias.

However, such educative camping seen to be less effective and the number of betel quid chewers is still on the rise. To satisfy the current demand, the growers cultivate more acre of betel leaf in Pantanaw Township. Betel leaf growers can earn a moderate amount of profit for their livelihood.

Betel leaf cultivating is a traditional activity in the study area. On the other hand, it may indirectly cause health damage to the chewers. This is a great problem of this specific economic activity of the study area.

Research hypotheses

Hypothesis 1 – The development of betel leaf cultivation in Pantanaw Township depends largely on the existing physical geographic factors.

Hypothesis 2 – The existence of betel quid shops near the schools, offices and in densely populated area enhances the undesirable bad habit of chewing betel quid.

Aim

The main aim of this paper is to study the processes of betel leaf cultivation and development of betel quid shops in Pantanaw Township within Ayeyarwady Region.

Objectives

- To assess the physical factors that affects the betel leaf cultivation
- To analyze the spatial distribution pattern of betel leaf cultivation
- To examine the future prospect of betel quid shops

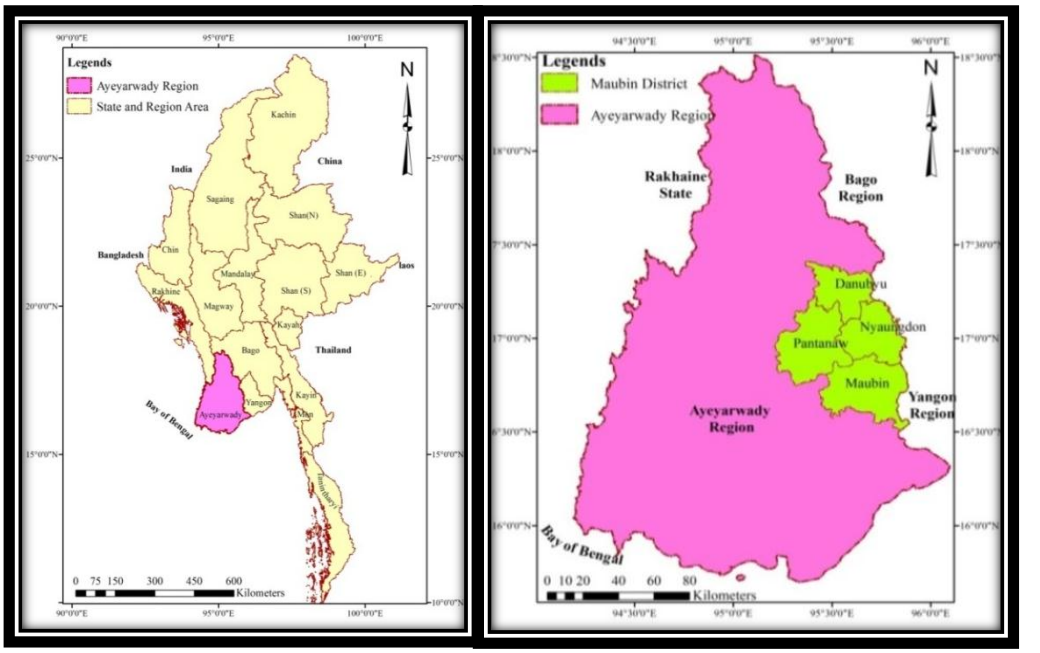
Data and Methods

In order to get the township boundary, ward, and village tract boundaries of the study area, it is digitized based on Google Earth Images (2017) and Land Sat TM Image (2013). Other facts and data are acquired from relevant offices.

The spatial distribution pattern of betel leaf cultivated land and aerial distribution of betel quid shops are analyzed by using ArcMap GIS 10 software and statistical methods.

The information data of cultivating process of betel leaf and number of betel quid shops are obtained from the field survey, interviews and discussion with consumers and shopkeepers of betel quid.

In order to know the perceptions of betel quid chewers, 100 people including teen-agers and above are randomly selected and given relevant structure interviews. The determination of sample size is not used a specific formulae, but it is determined purposively for the intended outcomes.



(a) (b)

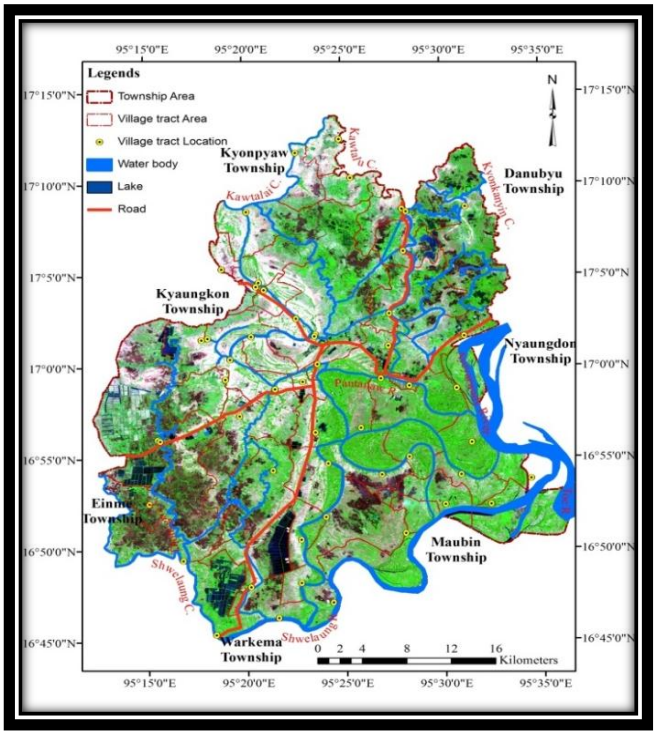


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Figure 1: (a, b,c) Location of Pantanaw Township in Ayeyarwady Region within Myanmar

Source: Digitizing based on Google Earth (2017), Landsat TM (2013)

Geographical Background of the Study Area

Pantanaw Township is included in the Maubin District. It is one of the 26 townships of Ayeyarwady Region, located at the southern part of Myanmar. It lies between 16˚ 48′ and 17˚ 13′ N latitudes, and between 95˚ 16′ and 95˚ 34′ E longitudes. It has an area of 1291.17 square kilometer (498.52 square miles).

The township is composed of rivers, creeks, inns, lakes, man-made embankments and low land. The average elevation of the land is less than 15 m (50 feet) above sea level.

The climate of the Pantanaw Township is controlled by the geographical location and the periodical shifting of monsoon winds. It enjoys

the tropical monsoon climate (Am). This climate is favourable for growing betel leaf.

Soils in the study areas are formed from parent material of young and old alluvium deposited by rivers and creeks. Meadow swampy clayey soils and meadow alluvial medium loamy soils are predominant in the study area. These are widely found within the township which represents 86.36 percent of the study area. These soils are suitable for betel leaf cultivation.

In 2016-17, the total number of population in Pantanaw Township was 264562 persons, including 19150 urban people and 245412 rural people.

Processes of Betel Leaf Cultivation

Betel leaf cultivation varies from place to place in Pantanaw Township due to several factors like types of soil, types of betel leaf, current demand and supply in the market, types of season, etc.

Before the planting, betel species should be immersed in a fungicide mixture for about 30 minutes.

Betel Leaf Environment

Betel leaf environment is defined by soils, climate, making fence, growing periods, betel leaf size and picking up.

Soils

The soil preparation is the first step for betel leaf cultivation. Although betel leaf can be grown in various soils, the most suitable soil is meadow alluvial loamy soils.

Firstly, the betel farm land is chosen, usually by the flat level land, well drainage and good sun shine. Then, the soil should be prepared by tilling 15cm to 20cm depth. To cultivate the betel plants, the land should be raised by 10cm to 15cm height from the adjacent areas within the plot. Then, the betel beds (low ridge) are prepared having 30cm to 35cm wide.

After the soil preparation, for about two or three days, betel plants are cultivated on the betel beds.

Climate

Tropical climate is favorable for betel leaf cultivation. Good quality leaves come out the not too wet and not too hot season rather than in the dry season.

Making of fence

The fence is constructed with poles, bamboo stakes, palm leaves, kaing poles and other fencing materials. The number of poles needed in a betel farm depends on the betel fence size. For instant, around 6 square meters (60 square feet) of farm size need about 3000 poles with a length of 4 meters (14feet) each.

Growing periods

Betel leaf is cultivated in rainy and summer seasons. In order to get the best quality of betel leaf, it is mostly cultivated in the rainy season.

The rainy betel leaf is mostly cultivated from the beginning of June to the end of December. The summer betel leaf is cultivated from the early October to the end of May.

Betel farm should be covered with coconut fronds, kaing leaves and other shading material for about 4 weeks.

Plate 1. (75) days old betel leaf

Plate 2. Construction the betel farm

After the planting of betel leaves for 45 days, new leaves begin appearing usually about 7 to 8 leaves. After 75 days, mature leaves are suitable for plucking from the betel plants and it attains about 1 meter (3 feet) in high.

Betel leaf size

Betel leaf size depends on types of soil, relief, drainage, feeding chemical fertilizer and shading condition on the betel farm.

Large size is commercial size and commonly used in the betel quid shops.

Large size: there are 1000 leaves per viss

Medium size: it contains 1200 leaves per viss

Small size: it occupies 2000 leaves per viss

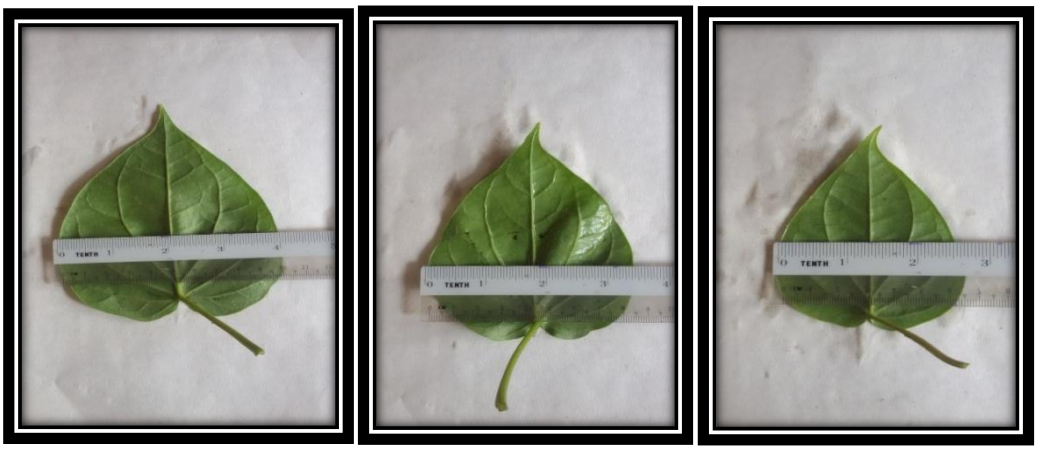


Plate 3,4 and 5. Large size (10 cm), medium size (9 cm) and small size (6 cm)

Picking up

Three months after the planting of betel leaf, mature betel leaves are picked up by hand along with a portion of petiole (the stalk of a leaf).

Mature betel leaf can be picked up 15-20 leaves once in 10 – 15 days. The yield depends on cultivation methods and types of betel leaf.

One packing basket contains 30 viss of betel leaves.

Types of betel leaf

There are two types of betel leaf. They are Myaungmya and Gwa species. These species are popular types in the whole township.

Myaungmya species

There are two types of Myaungmya betel species: red and green petiole. Myaungmya species fetches the highest price in market. Its flesh is more soft and delicate than other species. They can be grown easily in any soil.

Although the leaf is marketable leaf size and large bud, it sprouts a few buds. Each betel plant usually sprouts five or six buds in its lifespan.

The lifespan of this species averages five or six months. This type of betel plant is less resistant to weather conditions.It can be easily affected by pests that can destroy plants.

Gwa species

This species is small in buds and small in leaf size. It has also red and green petiole. It cannot be grown easily. After growing well, it can resist to pests. This species is more resistant to weather. The average lifespan is lasts up to ten or twelve months. It can also yield more betel leaves than Myaungmya species.

Another species can be grown in some villages in Pantanaw Township. This type is Ngaputaw species. It is similar to the Gwa species.

Plate 6 Myaungmya species

Plate 7 Gwa species

Spatial Distribution Pattern of Betel Leaf Cultivation

In Maubin District, the betel leaf total cultivated area was 998 hectares (2466 acres), comprising 393 hectares (971 acres) of Pantanaw Township in 2012 – 2013 which accounted for 39 per cent of the district betel leaf cultivated area. In 2016 – 2017, the total area under cultivation rose to 1032 hectares (2549 acres), comprising 416 hectares (1029 acres) of the study area which accounted for 40 per cent. The cultivated land of Pantanaw Township has slightly increased, the percentage is also slightly increased in the 5 year period from 2012 – 2013 to 2016 – 2017. (Table 1, Figure 2)

Table 1: Betel leaf Cultivated Area (Hectares) of Pantanaw Township in Maubin District (2012-2017)

Maubin District	2012-2013	%	2013-2014	%	2014-2015	%	2015-2016	%	2016-2017	%
Pantanaw	393	39	395	45	415	40	415	38	416	40
Maubin	212	21	212	24	212	21	314	29	314	30
Nyaungdon	328	33	207	24	333	32	294	27	223	22
Danubyu	65	7	65	7	67	7	69	6	79	8
Total	998	100	879	100	1027	100	2699	100	1032	100

Source: Department of Agricultural Land Management and Statistics (Maubin)

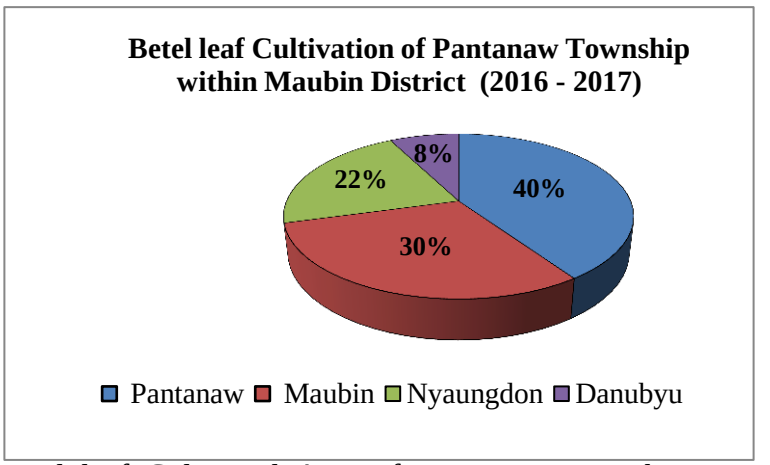


Figure 2: Betel leaf Cultivated Area of Pantanaw Township in District (2016– 2017)

Source: Based on Table 1

In the study area, only 4 wards out of 56 (Wards + Village tracts) had no betel leaf cultivated land in 2016 – 2017. These wards are Eastern Ward, Middle Ward, Western Ward and Extension Ward. The betel leaf cultivated lands are found widely in the whole township. The cultivated land mostly occupies the eastern portion of the township, that is, western part of Ayeyarwady River and Kazinngu, Bawaing, Shwekyaungmyauk, Tawchaung, Yaypawgyi and Khayakan villages. (Table 2, Figure 3)

There is one village tract, Kazinngu, cultivates above 24 (32 hectares).

In 2017, the township had 50526 households. Among them, 2424 household are practicing betel leaf cultivating activity. The number of household is greatest in Kazinngu Village Tracts with 176. Owing to increasing demand from market, the number of cultivated acres has increased, and this economic activity is traditional activity of Kazinngu Village Tracts. (Table 3, Figure 4)

Table 2: Number of Village Tracts in Betel leaf Cultivated Area (Hectare)

Class of Cultivated Area	Number of Wards and Village Tracts
Above 24	1
19 - 24	3
13 - 18	7
7 -12	11
1 - 6	30
0	4
Total	**56**

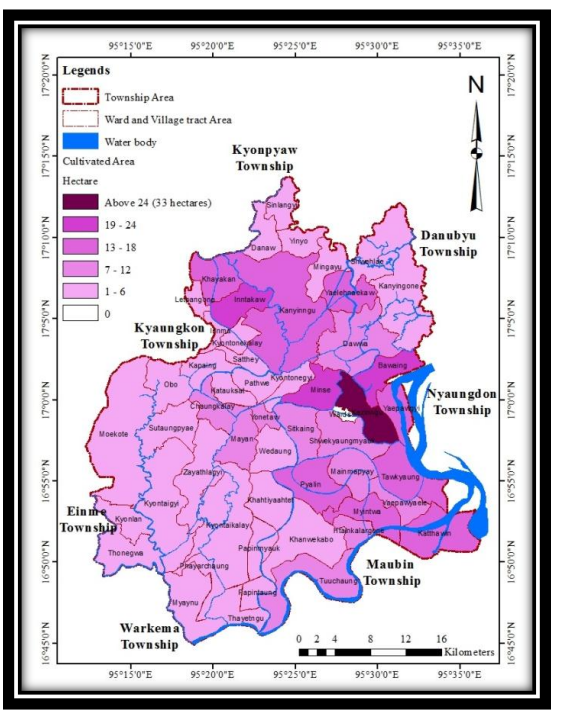


Figure 3: Distribution Pattern of Betel leaf Cultivated Area in Pantanaw Township (2016-2017)

Table 3: Number of Households that involve in Betel leaf Cultivation Activity

Class of Household Number	Number of Ward and Village Tracts
0	4
1 – 40	31
41 – 80	14
81 – 120	3
121 – 160	3
Above 160	1
Total	56

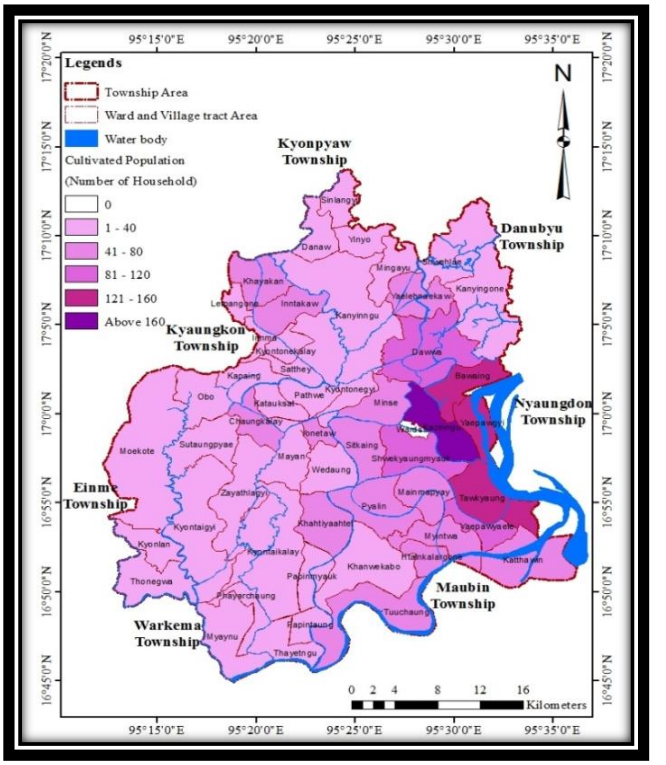


Figure 4: Distribution Pattern of the number of Household in Betel leaf Cultivation (2016-2017)

Source: Department of Agricultural Land Management and Statistics (Pantanaw)

Cost and Benefit Analysis of Betel Leaf Cultivation

Cost and benefit of betel leaf cultivation depends on the input cost and labor, using the fertilizer, disease problem, commodity flows and human health.

Input Cost and labour

Input costs include bamboo poles, betel species, wages of labor, fertilizer and pesticides, bamboo baskets and transportation.

In a farm which is 6 square meters (60 square feet) wide, to cultivate 2000 betel plants, 3000 bamboo poles are necessary. Bamboo poles are usually bought from Kyaunggone and Pathein townships. Each bunch of bamboo pole with girth one and half inches costs 1250 kyats. One bunch usually consists of 25 bamboo poles.

Betel species are available from Myaungmya, Gwa and Ngapudaw townships. Each betel species price is 50 or 55 kyats. The price of betel species can vary depending on the price of betel leaf.

For the construction of a betel farm, labor is essential. Most of the betel farmers have to hire laborers to erect bamboo columns, which cost 35000 or 40000 kyats for 1000 columns. The wages are different from place to place in the Pantanaw Township. The labor is also hired to pluck betel leaves which cost 2500 kyats a day per head. But for some, they have to pay 3500 kyats for ten viss.

In soil preparation, a bag (25 Kilograms) of fertilizer is necessary for 2000 betel plants. The price of one fertilizer bag is 10000 kyats. After planting of betel leaves, chemical fertilizer is applied to the betel plants, and the price of 10 kilograms of fertilizer is 4000 kyats.

Pesticides are essential for betel leaves cultivation. Cost of pesticides is 10000 kyats for every month in the cultivated period. But, some of betel farms are more costly for using pesticides.

Bamboo baskets are used to transport betel leaves. The price of per bamboo basket is about 1000 kyats.

The transport of one basket costs 2500 kyats from Pantanaw to Yangon by truck. These baskets are transported by motor boats from the villages to Pantanaw Town. Each basket costs 500 kyats for transport fee.

To cultivate 2000 betel plants, the average expense is about 350000 kyats in cultivated period.

Fertilizer and Disease Problems (Pesticides)

Regular feeding and watering will keep the betel leaf plants growing very lush. Application of chemical fertilizer is essential for higher yield and better growth. Chemical fertilizer is fed once in every 10 - 12 days.

Benefit effects of betel leaf

About three months later after being cultivated, they are ready to sell on market. Each betel plant yields average 30 betel leaves in a month and so about 60000 betel leaves are available from 2000 betel plants. There are 1000 betel leaves (10 cm length and 13 cm in width) in a viss and so from 2000 betel plants, about 60 viss of betel leaves are available. There can also be the fall or the rise of price of betel leaf on market. They sell betel leave at the price of 10000 kyats a viss when the price is high and 2500 kyats when the price in low. The normal price is 5500 Kyats.

From the beginning of plucking betel leave, about 330000 kyats (60 viss x 5500 kyats) are received per month.

The average benefit from 2000 betel plants is about 1,630,000 kyats (1980000 kyats – 350000 kyats) as a net profit in the plucked period (6 months).

Medicinal values of betel leaf

Betel leaves contain many health benefits, curative and healing properties. It is also a good source of calcium.

Betel leaf contains 85.4% of moisture, 6.1% of carbon hydrates, 3.1% of protein, 0.8% fat, 2.3% fiber per 100 grams. Therefore, it is used for the treatment of inflammations, applied for chest relief, cough and breathing difficulty in children and it relieves sore throat, relieves ear aches by dropping the juice of betel leaf, help in treating diabetes by reducing the level of sugar in blood, and treatment of acne and black spots on the face.

Commodity flows

Owing to demand from market, betel bamboo baskets are transported to other township's market especially to Yangon by car. Transportation systems include truck, motor boats and motor cycle from Pantanaw town to the market place such as Einme, Nyaungdon, Kyaungkon, Kyonpyaw, Danubyu, Maubin and Wakema townships.

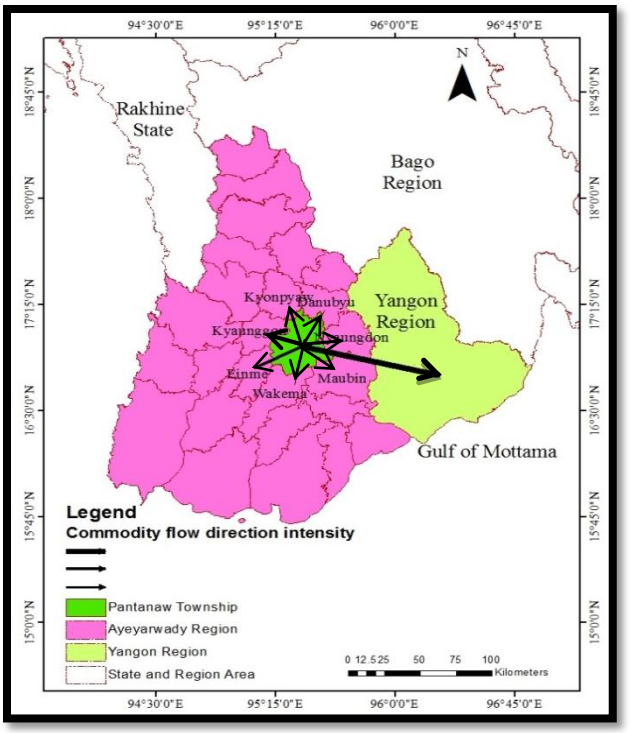


Figure 5: Commodity flow direction intensity

Studying the Betel Quid Shop in Pantanaw

Betel quid made up of the betel leaf is not a type of food. It includes slices of betel nut, lime, tobacco, catechu, aniseed, liquorice, cardamom, clove, spicy materials and others. These ingredients are wrapped together in a fresh green betel leaf. After chewing, the red colour of betel juice and betel pulp is spited.

According to the field survey, there are eight different types of betel quid in many betel quid shops in Pantanaw. These are named Regular (tobacco free), Myanmar tobacco (black), Myanmar tobacco (yellow), Queen (Parijat), Signal, Hundred, 92 and Bar Bar.

Plate 8. Myanmar tobacco (black)

Plate 9. Myanmar yellow tobacco

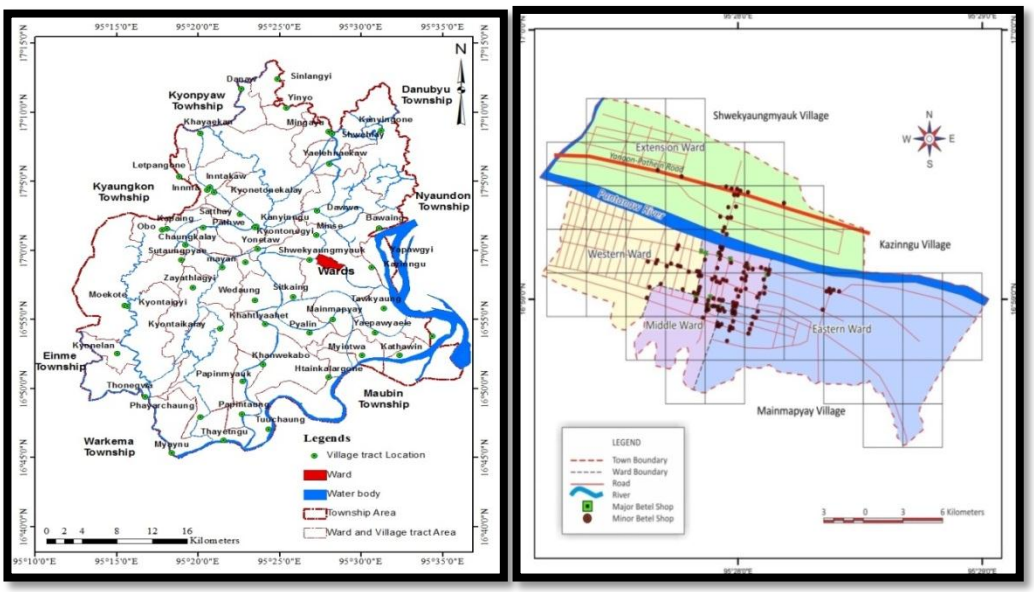
Plate 10. Foreign betel quid tobacco

The price of betel quid can change depending on the kind of ingredient. Generally the price is 100 kyats for four betel quid.

The betel quid shops in Pantanaw mostly get betel leaves from Kazinngu and Tawkyaung villages because it is located nearby the Pantanaw and betel plants are cultivated commercially. The main ingredient such as betel nut and other accessories are acquired from the Yangon Region.

The Study Area

There are very few betel quid shops in the rural area. The chewers make the quid by themselves at home. Most betel chewers of residents in town and daily workers buy it from the shops. Therefore, only betel quid shops in the four wards of the town area (3.34 square kilometers) are included as case study area. (Figure 6 a & b)



(a) (b)

Figure 6: (a & b). Location of Ward within Pantanaw Township
Source: Department of Agricultural Land Management and Statistics (Pantanaw)

Types of betel quid shop

According to the field survey, betel quid shop can be classified into two types: **1**. the shop which sell above 10 viss of betel leaves per day; it is defined as the major shop. There are 10 major shops in Pantanaw. **2**. the shops that sell below 10 viss of betel leaves per day, it is called minor shop. Minor shops are combined with other items such as cheroots, cigarettes, sweets and miscellaneous snacks. There are 113 minor shops in the study area.

Although most of the shops are those which sell the betel quid at a fixed place, some selling style can be seen on a three-wheeled motorcycle drive to designated place.

Plate 11. Major shop which sell out 25 viss of betel leaf per day

Plate 12. Three-wheeled mobile shop

Plate 13. Minor shops combined with cigarette

Spatial Distribution Analysis of Betel Quid Shop

Buffer analysis (Proximity)

Buffer involves the creation of a circular region around a point. The radius of the circle is determined by the analyst.

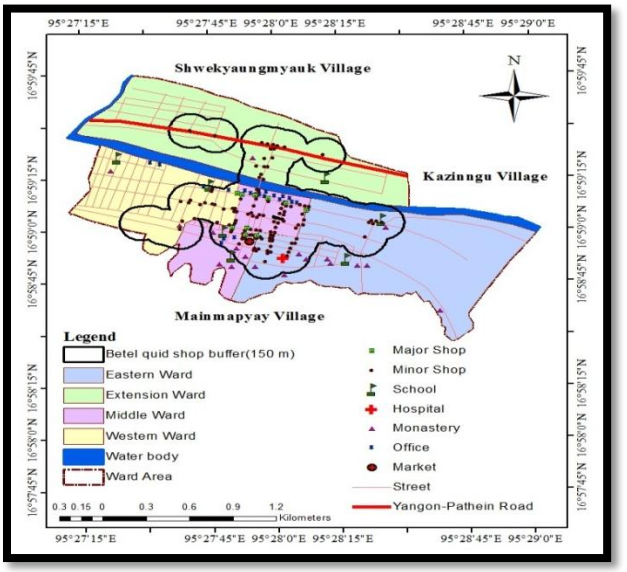


Figure 7: Spatial Distribution of Betel Quid Shops in Pantanaw by 150 meters Distance of Buffer Analysis (2017)

Source: Based on Author's observation

In this study, point is served as a betel quid shop. Distance buffer zone is created for buying distance from betel quid shop of 150 meters and the customers or consumers within 150 meters use for the attractive the shops.

According to the field survey, there are 123 betel quid shops in Pantanaw in which 10 shops are major shops. These are mostly located along Bogyoke Aung San, Bayintnaung, Anawyahta, Thiha and Yuzana streets within Middle Ward. Other minor shops are clustered along the Tapinshwehti, U Aung Zayya and other streets in Western Ward and Middle Ward, Eastern Ward.

Buffer analysis of ArcMap GIS reveals that there are several betel quid shops within 150 meters distance from 16 governmental offices, 1 hospital, 1 market, 1 monastic school, 1 basic education high school (BEHS) and 2 basic education primary schools (BEPS). (Figure 7)

The closeness of betel quid shops to schools can result in the acquiring of betel quid chewing habit by the school children at their early age. Some school children may get interested in earning income by selling betel quid at the bus stops and drop out of the school.

A number of betel quid shops are located close to the hospital, market and government offices, leading to all-time chewing of betel quid by the staff, degrading the environmental quality with red spits and negatively affecting their health.

Development of Betel Quid Shops

The habit of chewing betel quid is popular among the Myanmar people and most of the local people of Pantanaw consume betel quid regardless of age and gender.

With the construction and upgrading of bridges and roads for travelling in Ayeyarwady Region, Yangon-Pathein Road that crosses Pantanaw is mostly used by travelers from place to place. Bus drivers and conductors are the major consumers of betel quid. Thus street side small shops selling betel quid have increased in Pantanaw year by year.

For the reason mentioned above, the number of betel quid shops increased from 29 shops in 2012-2013 to 123 shops in 2016-2017. (Table 5 and Figure 8)

Among 123 shops in Pantanaw, Eastern Ward is occupied by 52 shops which account for 42 percent of the total shops in 2017. The reason of the increase in the number of shops is that Eastern Ward is always crowded with daily routine workers especially along the Bogyoke Aung San Street. Other concentrated areas in Eastern Ward are along the U Aung Zayya Street near the market.

Table 5:Temporal changes of betel quid shops in Pantanaw (2012 - 2017)

Wards	2012-13	2013-14	2014-15	2015-16	2016-17
Eastern Ward	6	8	11	32	35
Middle Ward	18	22	23	50	52
Western Ward	2	3	6	16	18
Extension Ward	3	4	4	15	18
Total	**29**	**37**	**44**	**113**	**123**

Source: Department of Township Development Committee (Pantanaw)

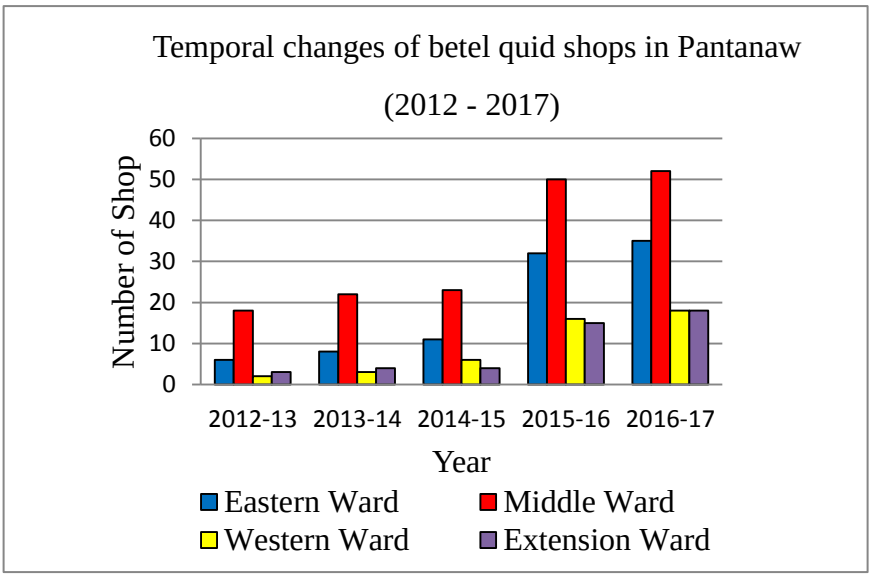


Figure 8. Temporal changes of betel quid shops in Pantanaw (2012 - 2017)
Source: Based on Table 5

Findings

The Pantanaw Township economy is heavily based on the agriculture sector. Betel leaf cultivation is also one of the important economic activities in the township.

The study area is mostly lowland formed by rivers and creeks. Much of the betel leaf cultivated lands especially Kazinngu, Tawkyaung, Pyalin, Shwekyaungmyauk, Yaypawgyi, Minse, Kanyingu, Mainmapyay and Khayakan villages are covered with meadow swampy clayey soil and meadow alluvial medium loamy soil. Cultivation of betel leave is a major livelihood of rural population of the study area.

Socio-economic role of betel leaf cultivation

. In Maubin District, the 'betel leaf total cultivated area was 1031.55 hectare (2549 acres), of which 416.42 hectare (1029 acres) were in Pantanaw Township in 2016– 2017 which accounted for 40 per cent of the district betel leaf cultivated area. (Table 1)

As in other townships, people are mostly concentrated in Pantanaw Town (Town population 19150 persons) with 14844 persons per square kilometer and the whole township with 205 persons per square kilometer. In 2016, the total number of population in Pantanaw Township was 264562 persons with 50526 total households. Majority of households, 38394 (76.15%) are engaged in farming. Betel leaf cultivators (2424 households) represented (4.8%) of total households.

120 households are betel quid shopkeepers occupying 0.24% of the total households.

Impact

There are two types of impacts: positive and negative impact.

Positive impact refers to the local people's socioeconomic positive impact.

Betel leaf cultivation within the study area not only provides jobs to the local inhabitants, but also enhances the economic development of the township. Betel leaf cultivation is maintained by traditional economic activity of the study area and it is used for some traditional medicines.

Negative impact is the adverse effects resulting from the cultivation of betel leaf. Human health is damaged by the effects of the pesticides. By touching the skin of people with the pesticides, the skin can cause allergy. If the people breathe the pesticides, they will cause dizziness.

Another indirect effect of betel leaf cultivation are chewing betel quid. The habit of chewing betel quid (including betel leaf, betel nut shred, Myanmar tobacco black and yellow, foreign tobacco and lime) can threaten consumer's health gradually leading to tooth decay, mouth cancer (C.A Larynx or Oral Sepmucous Fibrosis (OSMF)), tongue cancer (C.A Tongue), premature ageing and even to death.

Among these diseases, Oral Sepmucous Fibrosis (OSMF) disease is mostly common in Pantanaw. In 2013, local people suffered OSME disease was 3 persons and it increased to 5 persons in 2015. In 2017, 11 persons suffered this disease and among them 8 persons died. (The data are acquired from the Hospital of Pantanaw)

Discussion

According to the senior doctor of Pantanaw Township, buccal cavity cancer (Cheek cancer) is essentially caused by foreign tobacco put in betel quid in different forms and also by the repeated abrasion of lime. Such cancer is more common in people who keep the betel quid in mouth for a long time without chewing.

Because of spitting sputum repeatedly, it leads to indigestion. Nicotine included in tobacco may cause constriction of heart-vessel (Coronary artery or thrombosis) and hence hypertension and eventually stroke.

Toxic material is removed by liver and heavy intake of nicotine can damage the normal function of liver. In men, it can also lead to impotency.

Both smoking and chewing the quid can damage the people. In fact, the content of nicotine included in the tobacco wrapped in a betel quid is much higher than in a cigarette. In cigarette smoking much of the nicotine is burnt out.

Although the number of those who suffer from mouth cancer (OSMF) has been increasing in Pantanaw Township, a greater proportion of betel quid chewers have no problem. According to the structured interview responses of

100 betel quid shopkeepers, nearly all the betel quid chewers take only that include Myanmar black tobacco prepared with tamarind liquid, instead of with that prepared foreign tobacco imported from India.

Mouth cancer (OSMF) is most common in these who take betel quid with prepared foreign tobacco and those who keep the quid in the mouth for a long time. The shopkeeper of "U Soe Lay" betel quid shop started to prepare the Myanmar black tobacco with tamarind and others follow suit. To expel the hazardous chemical the betel nuts are boiled 5 times before making betel quid. Likewise, lime used in betel quid is treated 8 times with water to remove toxic chemicals. Everyday, he can sell out about 25 viss of betel leave with the betel quid.

To know the health conditions of betel quid chewers, 100 chewers are randomly selected and asked relevant questions. Among them, a greater proportion (61 %) are heavy chewers with 25- year experience of chewing and 77 chewers take more than 30 quid per day. They all look quite healthy.

These conditions suggest that the number of betel quid chewers is less likely to decrease in the foreseeable future and betel leaf cultivators and betel quid shops will remain unchanged in number, if not increasing in the study area.

Conclusions

Being part of the Ayeyarwady deltaic region, Pantanaw Township has a wide stretch of low flatland. As the township lies within the tropic temperatures are high throughout the year.

Betel leaf plants thrive on fairly high temperature. Under the monsoon climatic regime the alternate wet and dry seasons are the main characteristics. Betel leave plants depend on the rain water in the rainy season. In the dry season, the betel plants need to be irrigated. The irrigated water is available by sinking tube well or lake.

The existing soils, particularly meadow swampy clayed soil and meadow alluvium soils with loamy texture are best suited for growing betel leaf plants. The areas with such soils condition occupy a large proportion of the township. Therefore, as shown in **Table 1**, Pantanaw Township has the largest betel leaf cultivated area among the 4 townships of Maubin District.

As such **Hypothesis 1** "the development of betel leaf cultivation in Pantanaw Township depends largely on the existing physical geographic factors" is accepted.

The betel quid shops are located elsewhere in Pantanaw Township, particularly where people are more concentrated such as schools, offices, markets, etc.

The elder school children start chewing betel quid and the younger students imitates it, increasing the number of chewers.

In the beginning, the chewer usually start chewing the betel quid without tobacco, and then with little tobacco. The amount of tobacco gradually increases and the chewer become addicted with nicotine included in the tobacco.

According to structure interview result, 98 out of 100 chewers answered that betel quid chewing can damage the human health and 91 people know this information of the adverse effect of nicotine from different sources of media such as newspapers and television.

Among them, 78 people want to quit the bad betel quid chewing habit, but bad habit die-hard and it is difficult for them to quit. Whenever the level of nicotine falls in the blood of chewer, his brain commands him to take another betel quid.

As the betel quid shops are located close to the offices and markets, these working at these workplaces can easily get betel quid, thus increasing the number of heavy chewers.

Therefore **Hypothesis 2** "the existence of betel quid shops near the schools, offices, markets and in densely populated areas enhances the undesirable bad habit of chewing betel quid" can be accepted.

Table 6: SWOT analysis of betel leaf cultivation and betel quid shop

Items	Strengths	Weaknesses	Opportunities	Threats
Betel leaf cultivation	**1**. sustainable soil **2**. sustainable traditional work **3.** get profit within three months after planting	**1**. lose by disease and pesticide **2.** lose by climatic change	**1**. get more jobs	**1**. by touching to the skin of people with the pesticides, the skin can cause by an allergy. **2**. If the people breathe the pesticides, they will cause dizzy.
Betel quid shop	**1.** get the regular income	**1.** daily cost of about 500kyats **2.** dirty the surrounding by spit **3.** spitting sputum repeatedly leads to indigestion **4.** early aging **5.** leading to black teeth	**1.** get job	**1.** tobacco may cause constriction of heart-vessel and hence hypertension and eventually stroke **2.** damage the normal function of liver **3.** the seller's hands may have bruises due to the reaction of lime **4.** consumer's health gradually leading to tooth decay, mouth cancer, tongue cancer, premature ageing and even to death.

Suggestions

Although betel leaf cultivation and betel quid business are beneficial for the cultivators and betel quid shopkeepers, it can harm the consumer's health and pollute the surrounding due to the spit of betel juice.

Therefore, strict rules and regulations concerning with betel pulp juice spitting should be imposed on the consumers not only in Pantanaw but also at public places such as universities, offices, hospitals, on the road and bus stops.

Although betel quid chewing habit is discouraged due to health damage, the number of betel quid chewers is less likely to decrease and the economic activity of betel leaf cultivation and betel quid shopping may continue to survive in Pantanaw Township in the foreseeable future.

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References

All right Reserved, (2015). Developed In Association with Information and communication Technology Agency ,Department of Export Agriculture. 2015 www.agrifarming .in,All Rights Reserved. Power by saishiridi.com

Nandar Khin, Ma, (1997). Socio-economic Activities of Pantanaw Township, unpublished M.A. (Thesis), Department of Geography, University of Yangon

Tint Tint Moe, Ma, (2015). Assessment on Betel Quid Shops at the Bus Stops within Thanlyin Township, Research Paper, Department of Geography, East Yangon University

ရဲရင့်မင်းခန့်(ဖြစ်မခ)၊ ‘‘မြန်မာနိုင်ငံမှကွမ်းစားသူအယောက်၁၀၀၌ ၃၄ ဦးနှုန်း ခံတွင်းကင်ဆာ ဖြစ်ပွားနေ’’ ၊ နေ့သစ်သတင်း ဂျာနယ်၊ ၄.၆.၂၀၁၄ ။

ပန်းတနော်မြို့နယ်ပထဝီဝင်အနေအထား၊ ပန်းတနော်မြို့နယ်အုပ်ချုပ်ရေးမှူးရုံး။

ရာသီဥတုနှင့်ကောက်ပဲသီးနှံအစီရင်ခံစာများ၊လယ်ယာမြေစီမံခန့်ခွဲရေးနှင့်စာရင်းအင်းဦးစီးဌာန(ပန်းတနော်မြို့)

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