

## Changes and Development of Urban Land Use in Namhsan

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### Abstract

Namhsan Town is a small town situated in Northern Shan State. It is also a township of Palaung Self-Administrative Zone in the Shan State of Eastern Myanmar. And the town is very famous for tea and well known as "Tea Land". It is composed of six wards and the total area is about 1893 acres or 2.956 square miles. According to the data of 2019, the total population was 5130 persons and the density of population 7426 persons per square mile. Eight types of Land Use are found in Namhsan Town. Commercial land use does not apply because the town has no market. Among eight types of land use, residential land use, institutional land use and unused land changed. But there were changes in the patterns and structures of land use. These encouraged the development of urbanization in the town. This thesis aims to explore the social factors of change in the town, to explore the changes and development of the town during this period, to investigate the relationship between types and economic factors and to suggest future plans for the urban areas of the town. In this research descriptive method is mainly applied and also used GIS & RS. Land use pattern changes were measured by the combination of quantitative method and qualitative method. The main reason for changes in the development patterns of the town was that the town was destroyed by fire in 2012 and again in 2015. The results of the changes indicate that the residential area will increase by 250 acres and agricultural land use and unused land areas will decrease by 145 acres in Namhsan town until 2025. Unused land will be used and the built up area will increase 50 % from 2009 to 2025.

**Keywords:** population growth, land-use changes, development

## **Introduction**

Urban land use reflects the location and level of spatial accumulation of activities such as retailing, management, manufacturing or residence, supported by transport systems. Types of Urban spaces include recreation lands (open lands), parks of built facilities (sports centers), residential (houses and flats), transport (roads and rail networks), stations and airports, business and commerce (offices), shops and banks.

Land use is required to support human and ecosystem needs. Urban areas promote economic growth and satisfy housing, industrial and commercial needs of growing human populations. The factors influencing land use are: physical including soil fertility, slope angle, aspect, scenery, mineral potential etc.; economic including distance from markets and demand from markets; social including population size, legislation and government policies. Moreover, it is important to study the land use pattern to make judicious use of the resources that are available. This is part of resource planning. Therefore, it examines the important factors of urban land use of the study area.

## **Literature Review**

Land use can be defined as the use of land by human activities, not necessarily always for financial profit or gain. A basic distinction may be drawn between rural (agriculture, forestry, recreation, etc.) and urban (industry, commerce, housing, etc.) (Small & Witherick, 1990). Land use is the management of land to meet human needs. This includes rural land use, urban land use and industrial use (Clark, 1986).

Land use is determined by environmental factors: soil characteristics, climate, topography and vegetation. According to Rogers (2000), the major determinants of land use are; demographic factors such as population size and density; technology; level of affluence; political structures; economic factors: systems of ownership; attitudes and values.

Land use is the function of land and what it is used for. Land uses vary from area to area. In urban areas, land use could be housing or industry. Urban land-use uses models to try to simplify the way land is used in urban areas. Urban land use reflects the location and level of spatial accumulation of activities such as retailing, management, manufacturing or residence. They generate flows supported by the transport system.

Many scholars have stated their opinions regarding "Land Utilization". Towns are formed after the gradual development of villages. There are differences of opinion between the scholars in discussing how urban lands should be used according to location.

Among the theories submitted by the scholars who discussed “Urban Land Use”, two important theories are the Ernest Concentric Zone Theory and Homer Hoyet’s Sector Theory. Burgess had studied urban land use and in 1925, he studied land use of Chicago and submitted the Concentric Circle Theory. Homer Hoyts, who studied the growth of 70 American towns, submitted the Sector Theory.

There were many previous geographical points of view in urban land use. The topic of this thesis paper is “Changes and Development of Urban Land Use of Namhsan Town”. Most of them emphasize urban aspects. The book, 2019 Township Administrative Namhsan Town Guide lines For Facts Date, presents land use and land planning.

### **Study Area**

Namhsan is a township of the Palaung Self-Administrative Zone in the Shan State of eastern Burma (Myanmar). Prior to August 2010, the town was transferred to the newly created Palaung Self-Administered Zone. Namhsan is a hilly town and it also known as Tea Land. The town is very famous for tea.

### **Aim and Objectives**

- The main aim of this thesis is to study urban land-use of Namhsan which is essential for the development and changes in the study area from a geographical point of view.

The Objectives are

- -To investigate the urban land-use and structure
- -To explore the changes and development of town
- -To examine the influencing factors of urban land-use

### **Research Question**

1. How has the structure of urban land use changed?
2. What are the changes and development of town according to this period?
3. What are the influencing factors of urban land use in Namhsan?

### **Data and Methodology**

Two types of data are examined, primary and secondary. Primary data are collected from field observations and interviews. Sample is selected by using Random Sampling Method. In the study area,

the primary data is from field survey and open talks with local residents. Secondary data were collected from various departments - such as Namhsan Township General Administration Office, Namhsan Township Immigration and National Registration Department, Township Agricultural Land Management and Statistics Department, Meteorology and Hydrology Department - and obtained from articles, newspapers, records, research papers, project papers and books. And from the location and land-use map based on topographic map, UTM map, using Geographic Information System (GIS) software, satellite images received from Google earth and interviews. To depict a general picture of land use pattern, secondary data are obtained from various offices, institutions and departments.

This paper applied a mixed methodology approach. Descriptive methodology was used to chronicle the physical and land use changes. GIS and RS were also used to measure land use pattern changes in combination with quantitative and qualitative methods. Descriptive statistics were used to analysis the quantitative data.

### **Findings and Descriptive Data**

Namhsan is located in the North-eastern part of Myanmar and Northern Shan State. It's also in the Palaung-self Administrative Zone. Namhsan is at the intersection North Latitude  $23^{\circ}11'14''$  and  $23^{\circ}38'28''$  and East Longitude  $97^{\circ}51'90''$  and  $97^{\circ}50'40''$ . The total area of the town is 0.69 square miles. The town is composed of six wards, namely (1) Mingalar Ward (2) Mankhite Ward (3) Moegal Ward (4) Myoelae Ward (5) Manmine Ward and (6) Nammawall Ward.



town. Abundant rain can cause to damage the crops. Because of the town's topography, it falls between heavy rains. The general elevation of the town is above 4000 feet. The underlying rocks of the eastern Highlands are assumed to be metamorphic. Elevations above 4000 feet support pine forests. On the mountainous area covered with forests and the soils are the Red Brown Forests Soils. Also found is sandy soil, very effective when growing tea trees. The natural vegetation which is mainly Teak, Taung-ta-mar, Cherry, Apple Trees, Pine forests.

According to the Census of Myanmar, in 1973 the total population of Namhsan was 992 persons. In 1993, the total population was 2,657 persons, and in 2003, 3568 persons. In 2014 the total population increased by 1,841 persons to 4568. In 2019 it had gone up to 5,130.

The rate of population growth, however, was not the same from year to year. In 1983, the highest rate of population growth amounted to 5.86 %. The increase was because in Namhsan at that time many people entered the town and generated new lives. In 2014, the lowest population growth amounted to 1.36%. The decrease in population growth was because half the town was destroyed by fire. So, the town was in economic difficulty. There were low birth and immigration rates due to the fire. The increasing population growth rates are affected by immigration, economic development, transportation development and job opportunity.

In examining the population density and distribution of Namhsan Town, it was found that there was uneven population density and distribution within the town. Social and economic factors had influenced the uneven population density and distribution more than physical factors. The average population density of Mingalar Ward is 6,887 persons per square mile, Mankhite Ward is 3,345 persons per square mile, Moegal Ward is 349 persons per square mile, Myoelae Ward is 7,043 persons per square mile, Manmine Ward is 430 persons per square mile and Nammawall Ward is 2,350 persons per square mile. Mingalar Ward is the highest population density and Moegal Ward is the lowest population density.

### **Historical Background**

Most people who live in Namhsan Township are Palaung. They all came from Mongo plateau and are also called Mon-Khamar Tribe. In the language of Palaung, they are called Ta'ang (people who lived at the hilly regions). Palaung is derived from Chinese Language Ponlon (Dragon Nation); later this changed by Myanmar Language to "Palaung". At BC (100), Palaung nations entered Myanmar in 3 ways. Before the nomination of Namhsan, the people built a town 4 miles to the east named "Wain

Town Sein" (Shwe Sakar Myo) which now is in the location of "Phayargyi" village. The town had 6 wards and 26 villages on 5.8.1975.

### **Economic Activities**

Depending upon the geographical location of a region, suitable economic activities are carried out. Moreover, based on the development of the knowledge and technological skill of the inhabitants of the region, specialized economic activities are being changed and developed.

Namhsan Town is very famous for tea and well known as "Tea Land". The types of economic activities of Namhsan are as follows;

#### **Primary Production**

In Namhsan Town, the primary activities are agriculture and livestock breeding. It is situated in a mountainous area in a hilly region. There are many ranges and deep valleys. The town is surrounded by mountain chains. The elevation is 5,332 ft. above sea level. The southern part of the town is the highest with an elevation 7470 ft., decreasing towards the eastern and southern parts.

Climate controls the conditions regarding the social and economic factors. Thus climate can influence and control the land use of a region. Rainfall is the main factor that influences the agriculture activities of the town. Because of the topography, the town always falls between heavy rains. Temperature largely determines the types of crop most suitable for production. So, temperature is one of the most important factors that can influence tea plant growth.

According to the statistical data of 2009-2010, in Namhsan Town, the total cultivable land area was 52.23 acres. It was found that different vegetables, coffee plantings and banana plantings were demarcated as agricultural land. In 2018-2019, the chief tea area increased to 72 acres while other cultivated crop areas decreased for residential land use. In 2012 and 2015, the town was destroyed by fire and many residents emigrated. There were 27 tea enterprises; traditional wet leaves, dry sweet tea, and the total permanent workers were 250 persons in the primary production,

Livestock breeding, poultry farming and pig breeding industries were mostly carried on in marginal areas or outskirts areas. Formerly, pig breeding had been carried on commercially around Namhsan Town on a large scale. Due to the decreasing population, the availability of food supply was automatically changed. With an increase in urban development, it is found that there is a decrease in the population working in primary production. With regard to other livestock and animal breeding occupations, few people are engaged in subsistence farming and pig breeding industries.

### **Secondary Production**

Secondary production includes manufacturing and handicrafts. The chief processing industry is clothing including Palaung traditional with 11 enterprises in 2019. Most manufacturing is small scale family cottage industry. There are two food producers.

### **Tertiary Production**

Tertiary production includes trade and commerce; transportation and communications and services, administrative services; education services and health services. During the 2018-2019, in Namhsan Town, there were 27 privately owned commercial industries, 6 privately owned transportation industries and 44 industries connected with other services; workshops, gold shops, retail shops, telephone and accessories shops etc. .

### **Occupations**

From the field observation study and statistical data in 2019, it was found that population growth, poverty and infrastructure rarely provide an adequate understanding of land use change. Land use patterns take place in all occupation structures of local people, especially in students and farmers. Other occupations are sellers; general workers, dependents, tailors, laborers, general workers, service workers etc. Within Namhsan Town farmers are the largest in occupation and land ownership. General workers are second. Local farmers have abundant farm land and home land.

### **General Pattern of Urban Land Use**

The principal purpose of land use geography is the study of how man uses land. It can also analyze and appraise various land use problems. Land use is the human use of territory for economic, residential, recreational, conservational, and governmental purposes. Land is defined variously based on respective aspects depending on one's own perception. In various definitions of land, it counts as space, nature, productive force, commodity, location, property and investment. Aundrey N. Clark said that urban land use is the concentrated use of land for urban purposes over a relatively wide area, i.e. for an urban settlement. In the geographic study of urban land use, there are different basic characteristics. To get knowledge of the land use of a town or city, the whole city structure must be firstly be established

According to the field observation, eight types of land use can be found in this study area. These are:

- (1) Residential Land Use
- (2) Industrial Land Use
- (3) Institutional Land Use
- (4) Religious Land Use

- (5) Recreational Land Use
- (6) Agriculture Land Use
- (7) Transportation Land Use
- (8) Unused Land

(Because there is no market in this case, commercial land use is not included.)

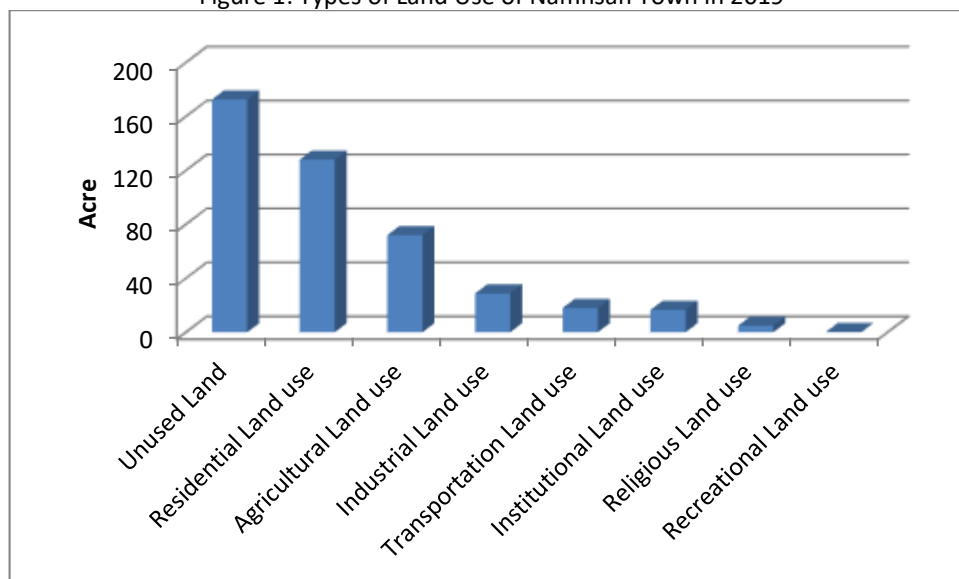
According to field observation, unused land is the largest area. That is because the town is located one side against an upward escarpment and the other side on a cliff edge. The town is very hard to build on. And also after the fires some people moved away and the area of their former houses was not rebuilt. Recreational land use is the smallest area. It only has one public park.

Table 1: Types of Land Use of NamhsanTown in 2019

Sr	Types of Land Use	Area	
		Acre	%
1	Residential land use	128	29
2	Industrial land use	28.74	5.2
3	Institutional land use	16.559	4.4
4	Religious land use	4.9	1.1
5	Recreational land use	0.223	0.1
6	Agricultural land use	72	16
7	Transportation land use	18	4.1
8	Unused land	172.6	39
	Total	441	100

Source: Department of Agricultural Statistics of Namhsan Town, 2019

Figure 1: Types of Land Use of Namhsan Town in 2019



Source: Table 1

### **(1) Residential Land Use**

Residential land use is the second largest area. There are six wards in Namhsan. The area of residential land use in Mankhite is 17 acres, in Mingalar is 24 acres, in Moegal is 15 acres, in Mammine is 22 acres, in Myoelall is 26 acres and in Nammawall is 24 acres. Although Myoelae has the smallest area of the wards it has the largest residential land use because it is located in a down town area. Most of dwellings are very close and congested. Moegal has the largest area but because it is a little bit far from the town and the dwellings are spread out it has the smallest area of residential land. In all there are 128 acres of residential land - 29% of the total urban area.

### **(2) Industrial Land Use**

Development of industrial land use is directly related to the process of urban development. Industrial land use is found in four wards namely Mankhite, Mingalar, Mammine and Nammawall. In Mankhite ward, the area of "Palaung Htate Htar" industry is 2.29 acres, in Moegal ward, the area of "Shwe Pyi Soe" industry is 0.95 acres and the area of "U Akie Bi" industry is 1.12 acres, in Mammine ward, the area of "U Htun Kyaw" industry is 1.3 acres and in Nammawall ward, the area of "Tat-ma-taw" industry is 23 acres. The total area of industrial land use in this town is 5.2% of the total urban area.

### **(3) Institutional Land Use**

Institutional land uses include schools and government offices. Most government offices are located group by group. 3 Basic Education high Schools are located in Mankhite ward and Nammawall ward. 6 Primary Schools are located in each ward. Hospital, Agricultural Department, Electrical Department and General Administrative Department are found in Mingalar ward, Police Station, Bank, Department of Agricultural Land Management Statistics are found Myoelae ward, Immigration and National Registration Department, Fire Station, City Hall, are found in Nammawall ward. Total institutional land uses are about 19.213 acres. The total area of institutional land use in this town has 4.4% of the total urban area.

### **(4) Religious Land Use**

Although the town has a small area, there are many ethnic groups and many different religions. The religious land uses are found in three wards namely Mingalar, Myoellal and Nammawall. The monastery is located in Mingalar ward and the area is 2.16 acres, the cathedral is located in Myoellal and the area 0.96 acres, the temple is located in Nammawall ward and the area is 0.62 acres, and the Chinese temple is also located in Nammawall ward and the area is 1.16 acres. The total area of religious land use has 1.1% of the total urban area.

#### **(5) Recreational Land Use**

Being small in urban area, land use for recreational is small too. The one park is found in Moegal - and the area is 0.223 acres. The total area of recreational land use is about 0.1% of the total urban area.

#### **(6) Agriculture Land Use**

Agricultural land uses are mostly found in Mankhite, Moegal and Nammawall wards - large wards located at the edges of the town. Most of the agricultural lands are used for growing vegetables and fruits. But only products from Nammawall ward are sold in the town; the other two wards produce food for the family consumption. Agriculture lands total about 72 acres - 16 % of the total urban area.

#### **(7) Transportation Land Use**

The areas of transportation land use are identified ward by ward. All of them are concrete roads. The main road is known as 'Bo Tay Za Road' and cuts through three main commercial wards. The total land use for transportation is 18 acres and the total area is 4.2% of the total urban area.

#### **(8) Unused Land**

The unused lands are found in every ward. Unused lands occupy largest area of all the categories. Unused land is 169.929 acres, or 39.1% of the total urban area.

### **Changes and Development Pattern of Urban Land Use**

Changes and development of urban land use in Namhsan are mainly caused by human activities. The pattern has changed slowly year by year. But the area of the town has not changed. The changes were mainly forced by the fires in 2012 and 2015. In 2012, the fire destroyed one third of Nammawall ward. And in 2015, Mingalar and Myolae wards were affected. Because of the fires, half of the town was destroyed, and there were changes in government policies. Among all eight types of land use, only residential land use, institutional land use and unused land were changed.

#### **(1) Residential Land Use**

In 2009, the pattern of residential land use in Namhsan was to have houses close to each other, as the town is located in a hilly area. Most housing types were wooden, and only a few were brick. The total area of residential land use was 169 acres. There were 860 houses altogether.

In 2019, the houses were not so close to each other and the wards Mingalar, Myoelae and Nammwall have concrete houses, because of the fires. The total area of residential land use is 128 acres. There were fewer houses as not all those destroyed were rebuilt, the people who lived there having moved to other towns and cities because of political assessment. 815 houses remained.

## **(2) Industrial Land Use**

In 2009, the industrial land use of Namhsan was 23 acres. This land use is rarely found in the town. Most industries are located in villages because of their larger area and because all the tea trees are found near the villages. At that time, the industries were run with traditional ways by human activities; tea products were seen as not attractively packaged and sales were below potential.

In 2019, the industries were run with the latest technology and fewer employees. The products are becoming export products to foreign countries. Namhsan tea is good quality and among the best tea products. Many consumers say that the tea products of other towns or cities can't compare with the quality and taste of tea products from Namhsan. So, not only scholars but also many foreigners are interested to study the tea. Unfortunately, after 2009 the town became a restricted area for foreigners. But many local researchers and scholars came to the town, got the data and wrote about their researches. The patterns of industries are also changed and the total area of industrial land use is 23 acres.

## **(3) Institutional Land Use**

As the town is small, institutional land use was small in 2009. At that time, the town had difficulty in transportation networks and the people were also less knowledgeable about economics, education etc. The total area of institutional land use was about 14.468 acres.

After 2010, the town became a Palaung Self-Administrative Zone and many offices like General Administrative Office, Government Offices and Departments, Department of Agricultural Land Management Statistics and many others were set up. So, the total area of institutional land use increased to 19.213 acres.

## **(4) Religious Land Use**

In 2009, the land for religious use was 4.9 acres. Religious land use can be found in three wards namely Mingalar, Myoelae and Nammawall. The monastery was located in Mingalar ward with an area of 2.16 acres. The cathedral was located in Myoelae ward with the area of 0.96 acres, the Chinese temple was located in Nammawall ward with the area of 0.62 acres and the temple was also located in Nammawall ward with the area of 1.16 acres.

In 2019, the area of religious land use is not changed. But the patterns and structures are changed by comparing with the 2009. The buildings are converted from wooden into brick and concrete. And also there are more buildings on the areas.

#### **(5) Recreational Land Use**

By comparing the years of 2009 and 2019, the recreational land use is not changed. It has only 1 park which is located in Moegal ward because the town is too small and located in difficult conditions. The is nothing in the park such as flowers and recreational tools. And local people do not go to the park for relaxation because the town is hilly and the weather is always cold or wet. The total area of recreational land use is 0.223 acres.

#### **(6) Agriculture Land Use**

The agriculture land use for Namhsan in 2009 was about 52.23 acres. Only Nammawall ward grew vegetables, such as kale, cabbage, water cress, chili, corn, cucumber, pumpkin, spinach, potato, tomato, Chinese potato and many others. The people sold the vegetables in the town. Local people also got vegetables from sellers from Hsipaw town. The sellers come to Namhsan by motorbike in the morning as the two towns are quite near.

In 2019, the agriculture lands have increased to about 72 acres. The people extend not only their farms but also the markets. Their vegetables are sold in Kyaukme town. Because of the extension of land, only a few sellers with motorbikes now come from Hsipaw town. But the vegetables and fruits grown are the same as before.

#### **(7) Transportation Land Use**

The transportation land use for Namhsan in 2009 had 18 acres. Then, the town had transportation problems. The roads and streets were mostly paved, but the town was hilly and rainy so the roads and streets were always damaged by natural hazards. Only a few roads were covered with concrete. The roads and streets were narrow with a width of 16ft.

In 2019, the transportation land use for Namhsan was still 18 acres. The areas are not changed. But all of the roads and streets are concrete and the government extended the width of roads and streets from 16ft to 18 ft. and some place into 24 ft. The reason for the extension of roads and streets was because of the fires in 2012 and 2015; the roads were too narrow for vehicles. So the government drew up a plan and many residential houses had to be moved back by 2ft and in some places 4ft.

#### **(8) Unused Land**

The unused land of Namhsan in 2009 was about 153.439 acres. All of those areas were covered with forests.

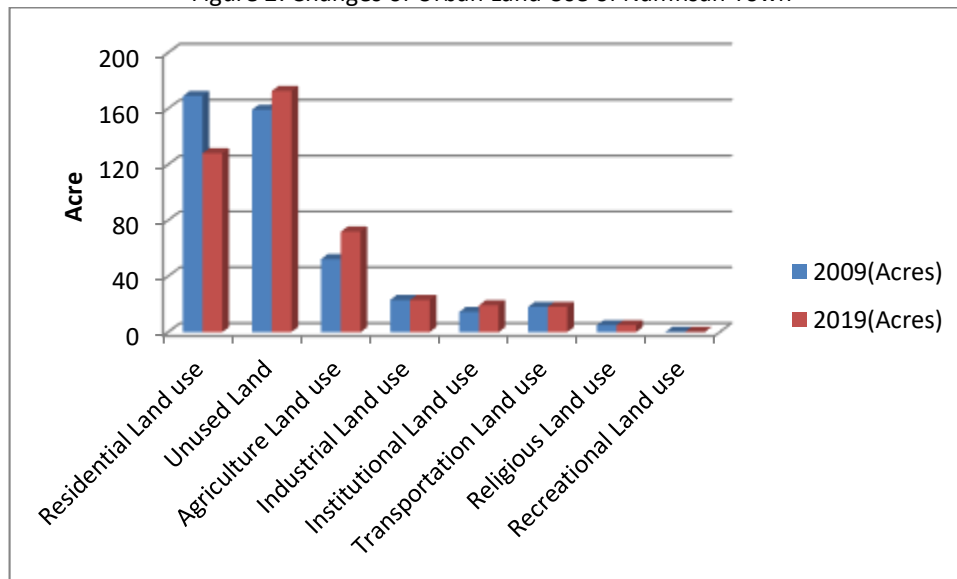
In 2019, the total area of unused land was 169.924 acres. This land use has the largest area because of the situation of town and some owners not rebuilding their houses after the fires: people abandoned their places and moved to the other cities and towns because the town was getting caught up in wars.

Table 2: Changes of Urban Land Use of Namhsan Town

No	Types of Land Use	2009 (Acres)	2019 (Acres)
1.	Residential Land Use	169	128
2.	Industrial Land Use	28.74	28.74
3.	Institutional Land Use	14.468	19.213
4.	Religious Land Use	4.9	4.9
5.	Recreational Land Use	0.223	0.223
6.	Agriculture Land Use	52.23	72
7.	Transportation Land Use	18	18
8.	Unused Land	153.439	169.924
	Total	441	441

Source: Department of Agricultural Statistics, 2009-2019

Figure 2: Changes of Urban Land Use of Namhsan Town



Source: Table 2

## Analysis

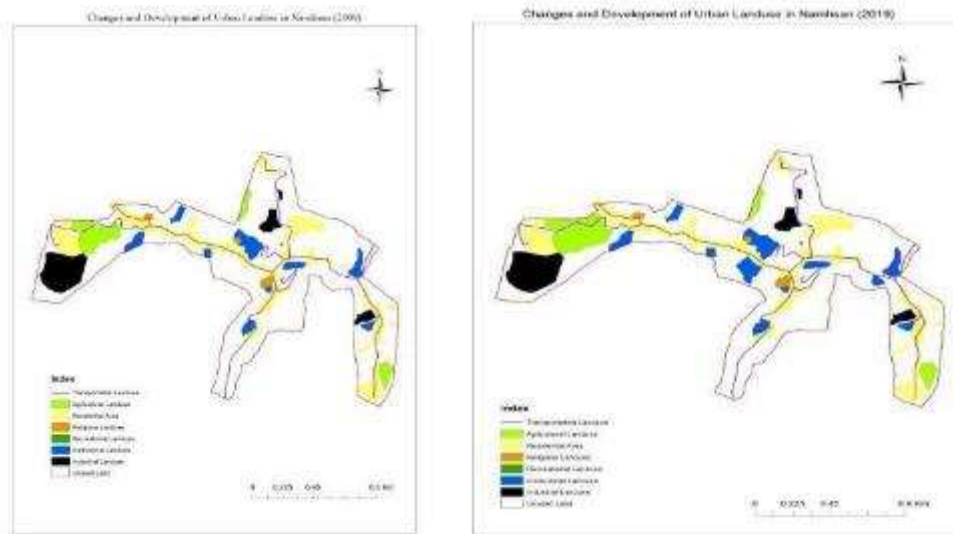
In this paper, 'Changes and Development of Urban Land Use in Namhsan' are analyzed by using RS, GIS, quantitative and qualitative methods. According to the analysis, the land use of Namhsan varies temporally and spatially. The temporal and spatial variations of land use are mainly found in three wards namely Mingalar, Myoelae and Nammawall. The total area of town is not changed. But the patterns and areas of land use such as residential land, institutional land and unused land were changed because of natural disasters. Prior to 2010, the hospital had moved to Minglar ward. The old place of the hospital is now at the site of the general ministry office. After the town became Palaung self-administrative zone in 2010, the Regional administrative zone was increased. By comparing two years 2014 and 2019, the town can see the houses are dispersed in three wards. Those wards are namely Mingalar, Myolae, Nammawall wards which were destroyed by fire in 2012 and 2015.

After 2012, many houses have been changed from wood to concrete. Because of the fires, the government promoted the town's infrastructure especially increasing road width from 18ft to 24ft. Some of land use areas such as transportation and residential were not expanded because of the situation of the town between mountain ranges. After the fires, the houses were built farther apart. The roads were also changed in some areas from unpaved to paved. The town found that unused land is the largest area. Another reason for that was that the town always falls between wars so some people moved away, mainly to Mandalay, to escape the feeling of insecurity for their lives, economic processes and their children's education. Their houses were not rebuilt which increased the amount of unused land.

Most urban areas are seen as growing year by year. But this town is not like that. From 2010, the town has electricity. All of the wards have Shwe-li electricity 24 hours. Unfortunately only a few villages have Shwe -Li electricity. Because of the influx of offices, there were many immigrants, most of them office staff. Economic patterns are also changed. The town can see many shops which used to be houses. But the workers are not efficient. Most of them are old, over 40. And the young workers are few as most of them went to China. Because of the current situation and political assessments, the town had less economic development and people believe that their opportunities and life circumstances will be better somewhere else. For decades, workers worked here in tea production and had high incomes. But lately the prices of tea have fallen and many workers have left the sector. Few people continue in their traditional occupations.

There are many changing developments in land use and its pattern is also temporally and spatially changing. After 2015, social and economic situations including living styles and housing patterns were abruptly changed. The main reason for the changing pattern was fire. Generally, the majority of

changes in land occurred in residential land use, institutional land use and unused land. But the area of town was not changed.



The two maps were obtained from field observations.

### Conclusion and Suggestions for Future Prospects

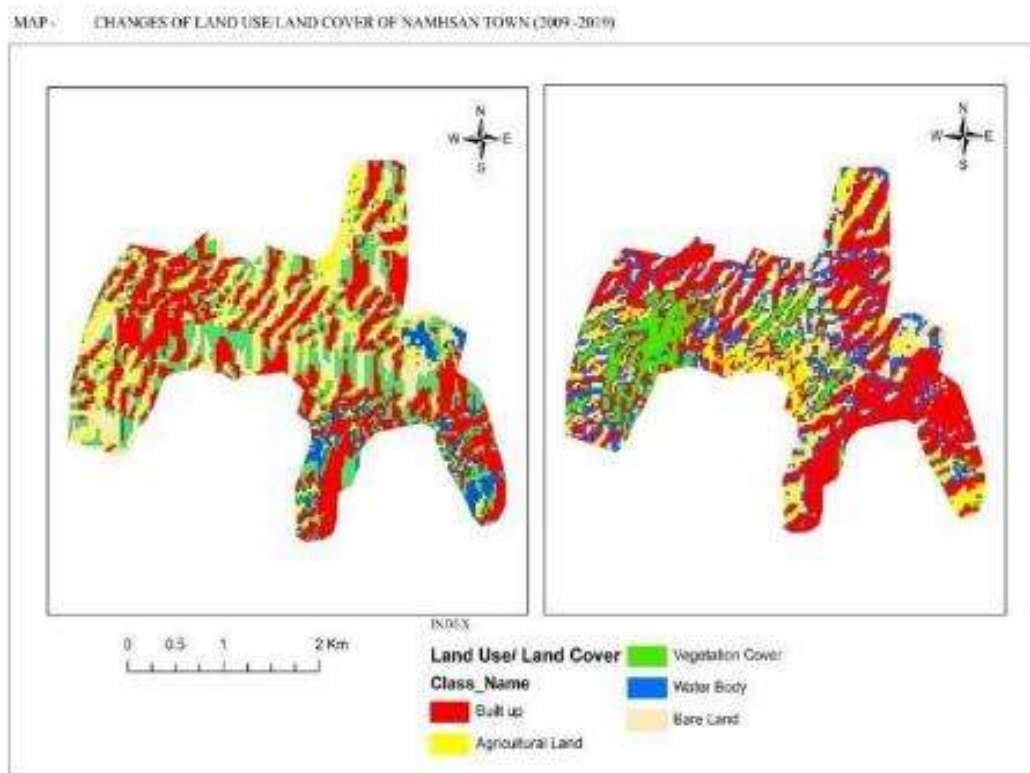
Namhsan is not only a hilly and small town but is also well known as tea land. The town needs many things to improve its image. The town has many educated people but they aren't helping the town to improve. They are stuck with traditional methods. And some have moved to work in cities like Yangon and Mandalay. So, the town has fewer educated people to provide their knowledge. Also the structure of the town has problems. And there is no market, only a temporary roadside market. So, the town needs a proper market to sell products. The town can't get enough water. They all use rainwater. There should be an adequate daily water supply.

The town is too small and the municipal truck can't take away all the solid waste daily. It tends to be polluted by solid waste disposal and sewage problems. So, the municipal garbage truck should remove the solid waste daily. Another need is for a vehicle park. When trucks enter the town there can be traffic jams because the roads and streets are too narrow. There is plenty of unused land to construct a market and a vehicle park. They need to construct them to improve mainly the economy. Finally, the town should gain the lenity and after that many advantages things will automatically come not only for the town but also for the people. And also if the town becomes open to tourists, it can earn a lot from tourist trade.

Table 3: The Changes of Land use/Land cover of Namhsam Town

Sr	Land use/Land cover	2009 (%)	2019 (%)	Changes (+/-)
1	Built up	48.76	53.83	5.07
2	Agricultural Land	6.86	15.69	8.83
3	Vegetation Cover	23.02	6.56	-16.47
4	Water Body	4.53	12.67	8.14
5	Bare Land	16.83	11.26	-5.57

Map 2:



Changes of land use cover of Namhsan Town; obtained from satellite images. They may slightly differ from the maps from field observations.



Figure 3: Fire of Namhsan Town in 2015



Figure 4: Residential Land Use (Housing Types) of Namhsan Town, 2019



Figure 5: Institutional Land Use (General Administrative Office, Namhsan), 2019



Figure 6: Transportation Land Use of Namhsan Town, 2019

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