



## SPATIAL ANALYSIS ON THE URBAN CHANGES OF TANINTHARYI TOWN IN MYANMAR

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**KEY WORDS:** Tanintharyi town, cultural heritage, physical environment changes, socio-economic activities changes, spatial urban changes

**ABSTRACT:** This paper observes the urban changes of Tanintharyi Town in Tanintharyi Region, Myanmar. Tanintharyi is one of the ancient cities where urban development is gradually invading the old city. So, the urban changes drive on the tangible and non-tangible environments. The objectives are to study physical environment changes, to examine the socio-economic activities changes, and finally to analyze the risk conditions of cultural heritage sites of Tanintharyi ancient city. The main data is obtained from the downloading of the satellite imageries (2012 and 2020) for the comparison of urban development changes. Data from field survey and open interviews with residents and authorized persons are collected to approach the destination for spatial and temporal changes of the physical environmental changes, socio-economic activities changes, and the present condition of cultural heritage sites with the aid of the Remote Sensing and Geographic Information Systems (RS& GIS) technology. The results show the spatial urban changes of the physical and socio-economic changes and the gradual decrease of the cultural heritage environment for the period 2012 and 2020.

### 1. INTRODUCTION

The wealth of nation is its people, its cultural heritage, its environment, and its natural resources. Cultural heritage defines the legacy of physical artifacts and intangible attributes of a group or society that is inherited from past generations. Not all legacies of past generations are "heritage", rather heritage is a product of selection by society (Logan, S. William., 2007). Cultural heritage comprises tangible culture (such as buildings, monuments, landscapes, books, works of art, and artifacts), intangible culture (such as folklore, traditions, language, and knowledge, etc.), and natural heritage (including culturally significant landscapes, and biodiversity, etc.) (J.R. Marshall, 2016). The protection of cultural heritage should also preserve the particularly sensitive cultural memory, the growing cultural diversity, and the economic basis of a state, a municipality or a region. (Action plan to preserve, 2019, Hosagrahar. L, 2017, Szostak. R, 2009). Cultural Heritage is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions, and values. Cultural Heritage is often expressed as either Intangible or Tangible Cultural Heritage (ICOMOS, 2002). This general definition incorporates monuments, buildings, sites, landscapes, as well as collections, conserved and managed by public or private institutes, museums, libraries, and archives, but also, practices, knowledge and other expressions of human creativity making hence no distinction between the so-called "tangible" and "intangible" cultural heritage. Although its importance and benefits for the local territory and communities have been widely acknowledged, in most cases, cultural heritage conservation is unfortunately not regarded as a priority by state governments in the development process, unless its relations with social and economic activities and international exchanges are made clear. While taking into full consideration the undisputable tangible-intangible the dichotomy of cultural heritage, and while acknowledging the value and potentials of the intangible cultural heritage, for the sake of this briefing the paper only the tangible, "built" cultural heritage of Myanmar will be taken into account, as the first to be considered "bankable", and internationally recognized for its value as a driver of development (Stetane. F, 2014). This research work is approached to conserve the value of cultural heritage of the ancient town of Tanintharyi.

## 1.2 Study area

The study area is Tanintharyi small town, Myeik District, Tanintharyi Region. It is surrounded by Tanintharyi River in Myeik District in Tanintharyi Region. Once, it is one of the ancient cities in Myanmar. At present, ancient handicrafts and documents can still be found in the city. The more developed the urban infrastructure, the less important become the cultural heritage site in the study area. Figure 1.1 shows the location of Tanintharyi Township. This town is located between North Latitudes 12° 4' 30" N and 12° 5' 45" N, and East Longitudes between 99° 0' 0" E and 99° 1' 45" E.

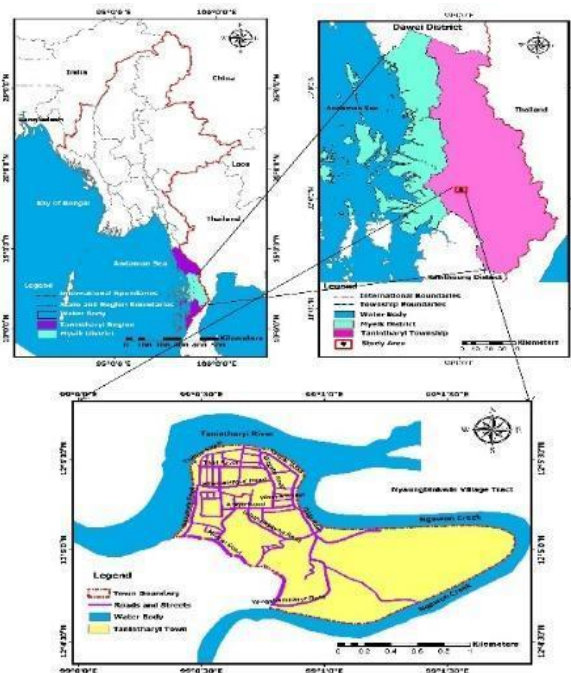


Figure 1.1. Location of Study area

## 1.2 Aim

The main aim is to conserve and value the cultural heritage of Tanintharyi ancient city.

## 1.3 Objectives

- to study the general concepts of cultural heritage sites
- to examine the environmental, physical and socio-economic changes of the study area
- to analyze the effect of physical and socioeconomic environments on the cultural heritage changes

## 2. DATA AND METHODOLOGY

There are two data types for this research work; primary and secondary data. The primary data is collected from the field surveys by taking drone pictures, asking deep questions to residents, and openly interviewing authorized persons, taking photos, and collecting ancient documents within the residential areas. The data includes open interview surveys (both online and face to face) for their opinion on urban development and cultural heritage sites. Taking drone photos enables updated current visualization with good resolution. (Plate 2.1). The secondary data such as population, household, crop products is obtained from the administrative offices. The Google Earth Pro has been used to check for the historical ground truth and compare it with the past and present of the land use and land cover changes. Most of the secondary data is obtained from the "Tanintharyi Chronicles and Cultural Heritage Traditions (Than Soe Win, 2017)" book and administrative offices and Google Earth Pro downloading.



Plate 2.1. Discussion and Open Interview, Taking Drone and Data Entry Process

Source: Based on the field observation (31.12.2019)

Based on the collected data, the research flow is created for consistency and consequences by creating tables, graphs, and figures. Changes and developments have been replacing the cultural heritage areas year by year. The opinions of residents respond to the impact of development that the cultural heritage sites have been disappearing over the last decade. So, this research work enables to compare the changes in the built-up area with past (2012) and current (2020) periods.

### 3. RESULTS AND DISCUSSION

There are many valuable historical ancient cities in Myanmar. Among them, Bagan, the heart of Myanmar and Tagaung are located beside the Ayeyarwady River and very famous Danyawadi, an ancient city of Rakhine State lies near the Kaladan River. Tanintharyi, one of the ancient cities in Myanmar, is located on the great Tanintharyi River. However, it is not famous because it is far from the urban area and there is not good transportation. (Than Soe Win, 2017). That is why this research work explores the cultural and geographical study of Tanintharyi. There are at least three factors that are presented from the geographical point of view. The changes are in physical, economic, and social environments.

#### 3.1 Physical environment changes

Tanintharyi is located between North latitude 90° N to 100° N and between East Longitude 10° E and 14° E. Most part of Tanintharyi is covered with trees and forest. The physical environment considers the built-up area, roads, and vegetation of Tanintharyi. Plate 3.1 and Figure 3.1 displays the land use types of the physical environment of the study area. Plate 3.1 shows the changes in the physical environment visually. In 2020, the urban infrastructure is more than 2012, especially roads and construction sites. The northwestern coastal area has clearly disappeared. Plate 3.2 illustrates new construction sites. Figure 3.1 presents the changes in land use and land cover changes in Tanintharyi.



Plate 3.1. Physical Environment Changes image (2012 and 2020)

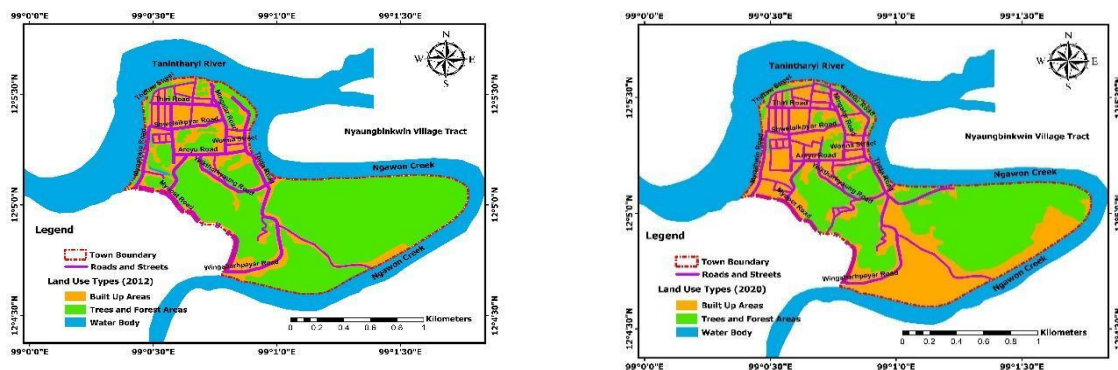


Figure 3.1. Physical Environment Changes in 2012 and 2020

Source; Based on google earth pro

Table 3.1. Physical Environment Changes in Tanintharyi (2012-2020)

Physical Environment	2012	2020	Change Area	
	(Area_sq km)	(Area_sq km)		
Built-up area	0.46	1.02	0.56	Increase
Trees and Forest	1.59	0.99	-0.6	Decrease
Road	0.0806	0.10	0.018	Increase
Water	0.55	0.59	0.04	Increase
Total area	2.1306	2.1086	-0.022	Decrease

Source; Output statistic of Figure 3.1

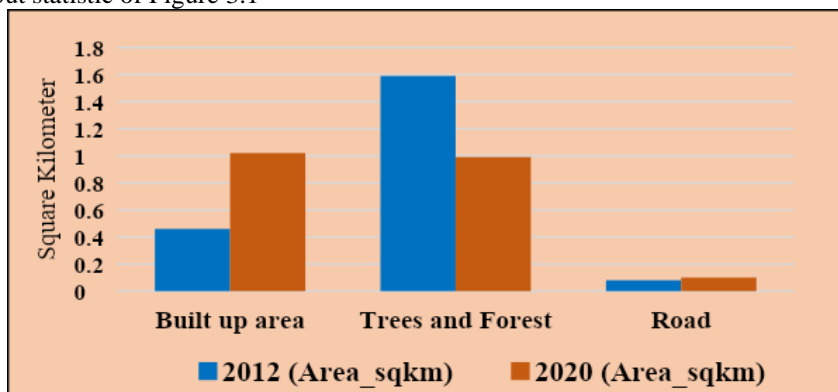


Figure 3.2. Physical Environment Changes (2012 and 2020)

Source; Based on Table 3.1

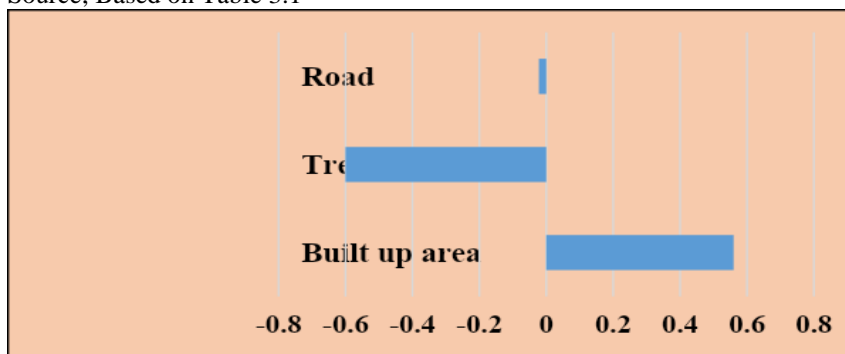


Figure 3.3. Changing Condition of Physical Environment (2012 and 2020)

Source; Based on Table 3.1



Plate 3.2. New construction sites in Tanintharyi

Source; Taking Drone Photo of Field Observation (31.12.2019)

According to the results of Figure 3.1 and Table 3.1, the physical environment of the study area is changing from 2012 to 2020. In 2012, the total area was 2.1306 square kilometers and 2.2086 square kilometers in 2020. Figures 3.2 and 3.3 illustrate the physical environment condition for 2012 and 2020. Based on Table 3.1, the built-up area or residential area increases about 0.56 square kilometers about 4.81 sq. km including land and water body. The tree and forest area have decreased to 0.6 square kilometers (1.59 sq. km in 2012 to 0.99 sq. km in 2020). The road area rises 0.04 square kilometers within 8 years and is still being constructed for smooth transportation. According to the data, the physical environment is changing due to the meandering rivers and human activities.

### 3.2 Socio-economic Environment changes

The socio-economic environment is the relationship between society and economy. The population of study area is 5284 in 2014 and 6537 in 2019. The household number is 1174 in 2019. The study area is constructed with two wards, namely Chaungmagyi ward and Chaungmange Ward. Their economy is based on horticulture such as vegetation, flowers, and gardens. Betel nuts, rubber, and palm oil are the main products of the study area. The growing population and urban infrastructures are increasing and they upgrade the living styles of local people. Plate 3.3 shows the past and present situation of changes in the social environment.



Plate 3.3. Changes in the social environment (images of past and present)

Source; Based on Than Soe Win (2017), and Field Observation (31.12.2019)

### 3.3 Cultural Environment changes

Tanintharyi is a small town and it is also an ancient royal city of Tanintharyi Region. Most items of Tanintharyi



cultural heritage are abundant. The exploration reveals the site of the palace, town defense wall, coins, beads, and various ancient items.

Table 3.2 describes the 18 historical-cultural heritage places of Tanintharyi. The names of gates are placed' gate 1 and 2, Mingalar/ Thargaya gate, Thita gate, Manle gate, Sin Phyu gate, Magayaza gate, Nanda gate, and Malar gates. The walls still exist at the corners of the southern and western sites, corner of Myawustin between southern and eastern wall, corner of eastern and southern walls, and corner of eastern and southern Walls. Others are Yazamingalar Lake, Yazatilawka Nanoo pagoda, Phya Aung Tha pillar stone, the palace (*Nantawgon*) 1, and 2.

Table 3.2. The Cultural Heritage Environments of Tanintharyi City

Sr.	Location	Latitudes	Longitudes	Altitude (above sea level)
1	Palace Gon No.1	99° 00' 37.2"	12° 05' 20.2 "	86
2	Palace Gon No.1	99° 00' 39.5 "	12° 05' 21.5 "	80
3	Yazatilawka Nanoo Pagoda	99° 00' 45.9 "	12° 05' 16.5 "	83
4	Yazamingalar Lake	99° 00' 54.8 "	12° 05' 18.2 "	86
5	SinmaAung Tha Rock Pile	99° 00' 39.2 "	12° 05' 21.5 "	80
6	Mingalar/Thargaya Gate	99° 00' 47.3 "	12° 05' 05.5 "	76
7	Thita Gate	99° 00' 32.5 "	12° 05' 20.1 "	100
8	ManLe Gate	99° 00' 40.3 "	12° 05' 33.5 "	79
9	Sin Phyu Gate (Gazayaza)	99° 00' 44.4 "	12° 05' 32.1 "	89
10	Magayaza Gate	99° 00' 35.0 "	12° 05' 32.5 "	79
11	Thayenadi Gate	99° 00' 29.0 "	12° 05' 27.2 "	87
12	Nanda Gate	99° 00' 29.4 "	12° 05' 21.6 "	32
13	Malar Gate	99° 00' 34.1 "	12° 05' 09.1 "	73
14	Corner of Southern and Western Walls	99° 00' 35.6 "	12° 05' 07.4 "	109
15	Corner of Myawutsin between Southern and Eastern Walls	99° 00' 29.1 "	12° 05' 10.9 "	74
16	Corner of Eastern and Southern Walls	99° 00' 48.1 "	12° 05' 29.7 "	194
17	Corner of Eastern and Southern Walls	99° 00' 55.6 "	12° 05' 07.4 "	109
18	Wall of Tanintharyi (Palace)	90° 1' 00 "	12° 16'	Junction of Tanintharyi rivers, about 3 km from the foothill of Thamakuta footprint mountain

Source; Based on the record of Hla Oo Naing (Geology, 23-5-2013, observation)

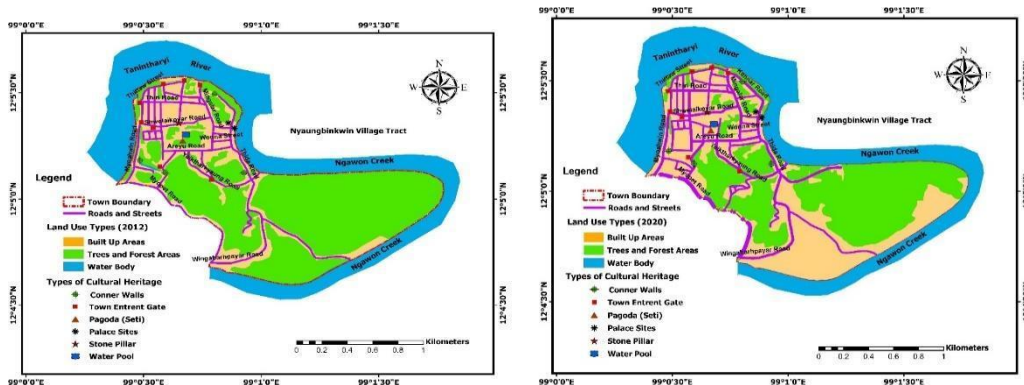


Figure 5. Cultural Heritage sites in 2012



Plate 3.4. Ancient Walls, Coins, and Ancient Stones

Source; Based on Field Observation (31.12.2019)

Plate 3.4 shows the searching and findings of the cultural heritage items in Tanintharyi. They are ancient walls, stone ladder, ancient pagoda, gates, stones, and various types of coins. These are the ancient civilizations of Tanintharyi

#### 4. CONCLUSION

Figure 4.1 shows the ancient Tanintharyi and current Tanintharyi. At present, the ancient city is gradually being encroached by the urban infrastructure. The gates and the walls can still be found in the residential area (Plate 3.4).

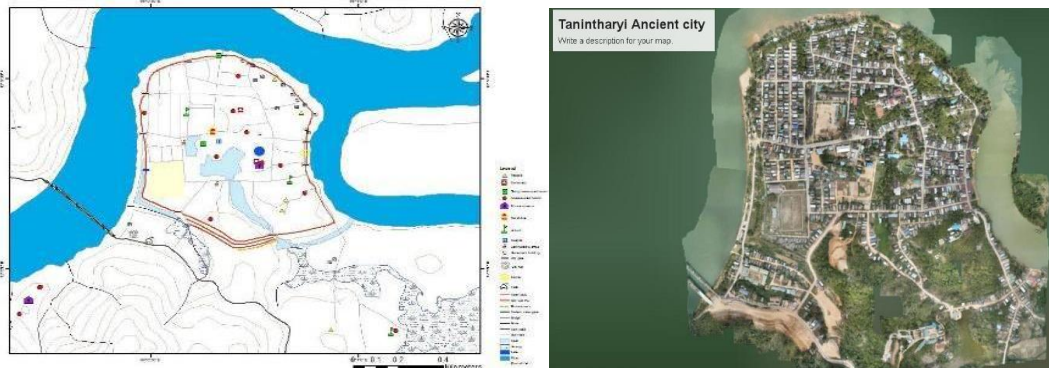


Figure 4.1. Ancient Tanintharyi City

Source; Based on Than Soe Win, 2017 (left) and Digital Orthophoto (31-12-2019)

Actually, Cultural Heritage has been declared as the second most important wealth of a nation in Myanmar Environmental Policy. It is affected by ten risks in cultural heritage management and only two out of ten are natural causes, while 8 are causes of human activities. This study clearly illustrates the key drivers of change as both demographic, and climatic. Urgent evaluation of current urban expansion policies, responsible tourism, natural disaster management, and national heritage management are crucial for the sustainable development of the study sites.

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