

A GEOGRAPHICAL ANALYSIS ON POPULATION DISTRIBUTION AND DENSITY IN URBAN AREA OF SHWEBO TOWNSHIP

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Abstract

This paper studies the population in urban areas of Shwebo Township, especially the population distribution and density which are affected by spatial variation. Moreover it is found that the area of the each quarter in Shwebo is directly related to population distribution. The functions of population cluster such as purified water supply, education and health care system, transportation and communication, work opportunity in cottage industry, marketing for local products and security lead to cause large and dense population. The largely populated area in Shwebo, Quarter (10), it is also the industrial zone and is situated near Shwebo University on the Shwebo-Myitkyina road and Shwebo-Kyaukmyaung-Singu (Mandalay Region) road. Therefore the accessibility of transportation and cottage industries are mainly influenced on population density. The densely populated area of Nwenein in Kyaukmyaung has large scale glaze factories in Myanmar.

Introduction

Shwebo Township is one of the 37 townships in Sagaing Region, which is in the Central Dry Zone of Myanmar. In the date of (13-9-2010) Kyaukmyaung was transformed to Sub-Township by combination of four quarters and ten village tracts (Ma-U, Onbauk, Shwegun, Tebin, Malar, Gwebingon, Kangyidaw, Makauk, Kalama, Sebingyun) including (17) villages. Thus Shwebo Township comprises Shwebo and Kyaukmyaung towns and 72 village tracts including 168 villages. It has a total population of 235,542 persons in 2014. Its population density per square mile is 571.44 persons in 2014. Shwebo and Kyaukmyaung are the urban areas of Shwebo Township.

Shwebo is a city in Sagaing Region, 110 km north-west of Mandalay between the Ayeyarwady and the Mu rivers. The city was the origin of the Konbaung Dynasty, established by King Alaungpaya in 1752, that was the dominant political force in Burma after the mid 18th century. It served as Alaungpaya's capital from 1752 to 1760. It lies between north latitudes 22° 34' and east longitudes 95° 42'. It has an area of 3012 acres or 4.69 square miles. Shwebo is composed of (10) quarters and (50) wards. Shwebo has an area of (3012) acres or (4.69) square miles. Its population was 69,036 persons in 2014, of which 32,425 are male and 36,611 are female. Its population density was 14719.83 persons per square mile in 2014.

Kyaukmyaung lies between North Latitudes 22° 35' and East Longitudes 95° 57'. In the date of (13-9-2010), Kyaukmyaung was transformed to Sub-Township, Kyaukmyaung village tract become a town in Sagaing Region. It is situated 46 miles north of Mandalay on the west bank of the River Ayeyarwady, and 17 miles east of Shwebo by road. Kyaukmyaung is an inland port of the Ayeyarwady waterway from Mandalay to Katha. The Ayeyarwady River passes through for about 27 miles along the eastern boundary of the sub-township. It is not beneficial for irrigation system but it is important for waterways. Its depends on its transportation accessibility and agricultural productivity of "Ya" crops such as groundnut, sesame, sugarcane, pigeon pea, green gram and others. In addition, next attractive functions of Kyaungmyaung are fresh water fishing industry and inland waterways in the Ayeyarwady River. There are many seasonal immigrants skills in fishing industry and waterway transportation, and then some have become to settle here. On 24th August 2013, the Ayeyarwady Bridge (*Yadanathein -kha*), connected with Singu, Mandalay Region, was inaugurated and thus transportation between east and west regions of the Ayeyarwady River has become more convenient and can be made in all seasons without any hesitation and

difficulty. It will certainly affect on the development of Kyaukmyaung into an urban area from headquarter of the sub-township. These transportation links of Shwebo-Kyaukmyaung road and Ayeyarwady Bridge (Yadanatheinga) will be promoted to the development of socio-economy in the eastern rain-fed area of Shwebo Township. The Ayeyarwady River passes through for about 27 miles along the eastern boundary of the sub-township. It is not beneficial for irrigation system but it is important for waterways. Kyaukmyaung is composed of (4) quarters that include Kyaukmyaung, Yedaw, Nwentyein, Letywe and Hnawbin villages. Kyaukmyaung has an elongated shape. It has an area of 19.46 square miles or 16839.6 acres. The total population was 10,703 persons, of which 5056 are male and 5647 are female in 2014. Its density was 550 persons per square mile in 2014.

Aim and Objectives

The aim of this paper is to study the population distribution and density in urban areas of Shwebo Township, and how population distribution patterns change according to the physical environment of studied area The Objectives are:

- To study variation of population distribution and density in urban areas of Shwebo Township.
- To clarify whether the location and area affect on population distribution and density in urban areas of Shwebo Township.
- To clarify whether the cottage industry especially the glaze industry affects on population density of the Kyaukmyaung.
- To analyze the relationship of area and population distribution.

Data Base and Methods

Both secondary and primary data are collected from the various Government offices and by interviewing with the local people. To classify the level of distribution and density of population in the study area, numbers of variables are applied. Coefficient of variation is calculated to show the regional disparity. The current population data for the year 2014 are collected from Village Tract Peace and Development Councils, Immigration and National Registration Departments of Shwebo Township. Then the collected data are processed and transformed into necessary and useful data by using computer. These processed data are analyzed by means of graphical methods, quantitative methods, and regression method.

Population Distribution and Density in Shwebo Town

Shwebo is composed of (10) quarters and (50) wards. Shwebo has an area of (3012) acres or (4.69) square miles. Its population was 69,036 persons in 2014, of which 32,425 are male and 36,611 are female. Its population density was 14719.83 persons per square mile in 2014.

In Shwebo, Quarter (1) is composed of Butaka, Butahka and Pynze North wards, which has an area of 407 acres or 0.63 square mile. It has a population of 8,915 in 2014. Quarter (2) is composed of Pynze South, Dovedan and Kyonedawtwin wards, which has an area of 221 acres or 0.34 square mile. It has a population of 5677 persons in 2014. Quarter (3) is composed of Bogone, Sargyingone, Eaindaryart, Thetkedan and Zaydan wards, which has an

area of 285 acres or 0.45 square mile. It has a population of 4067 persons. Quarter (4) is composed of Anaukze, Kyidawsu, Mayoegon and Aungzeya wards, which has an area of 284 acres or 0.44 square mile. It has a population of 7446 persons. Quarter (5) is composed of Minyartkyetthit, Sinyon and Minyart wards, which has an area of 227 acres or 0.35 square mile. It has a population of 6,917 persons. Quarter (6) is composed of Thakhuttaw and Kyedainsu wards, which has an area of 196 acres or 0.31 square mile. It has a population of 4,512 persons. Quarter (7) is composed of Seikkunsu, Songone, Shansu, Myeiksu, Wetletywe, Kyigone and Chibasu wards, which has an area of 308 acres or 0.48 square mile. It has a population of 8276 persons per square mile in 2014. Quarter (8) is composed of Aungchantha, Thidagu, Pyidawtha and Wundaweain wards, which has an area of 203 acres or 0.32 square mile. It has a population of 6226 in 2014. Quarter of (9) is composed of Nemye 1 to Nemye 12 wards, which has an area of 353 acres or 0.55 square mile. It has a population of 4876 persons. Quarter (10) is composed of Thayetchan, Htudaundye, Seinphaya, Mezebinsu, Myittagan, Kyoetbingon and Khyetthit wards, which has an area of 528 acres or 0.82 square mile. It has a population of 12124 persons in 2014.

In Shwebo urban area, quarter (10) is the largest number of population and quarter (3) is the smallest number of population. The largest number of population, quarter (10) is also the largest area (528 acres or 0.82 square mile) and it can be divided into the areas of western and eastern portion by Thetkeddan Chaung (stream). The western portion of Thetkeddan Chaung (stream) was extended during the 1972-73 and composed of original villages of Mazalebingon, Minywathit, Zegaly, Nwalaygon and Htudaungye block. There are many governmental offices and apartments such as Irrigation Department, Department of Construction, and District Administration Department. During 1995 to 2000, the eastern portion of Thetkeddan Chaung (stream) was extended to an urban area at the end of the Shwebo University. The migrant population of Shwebo is very interested to dwell in this portion of Quarter (10). This portion has very suitable soil foundation of Red Brown Savanna Soil for buildings and sufficient on water supply by artesian tube wells and accessible transportation roads by the high way of Shwebo – Myitkyina. Many people were moved to the Industrial Zone and the Shwebo University environmental area. There will be more and more developed in this Quarter (10) with economically and accessibility of transportation; Shwebo – Kyaukmyaung road (17miles) after the completion of Ayeyarwady Bridge (Yadanatheinkha) connected with Singu Township, Mandalay Division.

The smallest population of Quarter (3) is also the small area (285 acres or 0.45square mile) because it includes governmental office, official residences, recreation park, guest house of the chief of the state, desuetude airfield, football field, monasteries, moats, governmental nursery school, police station, electric power generation EPC office , army, court, philanthropic youth development camp, etc.

The resulting regression equation $y = -0.0204x + 29.741$ the determinant $R^2 = 0.1346$ and the correlation coefficient $r = +0.5$ indicate that there is high degree of positive correlation between area and total population in Shwebo.

The mean population density of Shwebo is about 14719.83 persons per square mile or 22.92 persons per acre. In Shwebo, Quarter (1) which has an area of 407 acres or 0.63 square mile and its population density was 14150.79 persons per square mile in 2014. Quarter (2) which has an area of 221 acres or 0.34 square mile and its population density was 16697 persons per square mile in 2014. Quarter (3) which has an area of 285 acres or 0.45 square mile and its population density was 9037.77 persons per square mile in 2014. Quarter (4) which has an area of 284 acres or 0.44 square mile and its population density was 16922.73 persons per square mile in 2014. Quarter (5) which has an area of 227 acres or 0.35 square mile and its

population density was 19762.86 persons per square mile. Quarter (6) which has an area of 196 acres or 0.31 square mile and its population density was 14554.84 persons per square mile. Quarter (7) which has an area of 308 acres or 0.48 square mile and its population density was 17241.67 persons per square mile. Quarter (8) which has an area of 203 acres or 0.32 square mile and its population density was 19456.25 persons per square mile. Quarter (9) which has an area of 353 acres or 0.55 square mile and its population density was 8865.45 persons per square mile. Quarter (10) which has an area of 528 acres or 0.82 square mile and its population density was 14785.37 persons per square mile.

The highest density of population in Shwebo urban area was Quarter (5), which has 19762.86 persons per square mile or 30.47 persons per acre. This quarter lies on the south and southeastern corner of Shwebo and it has a small area. This area includes Shwebo General Civil Hospital, special clinics and Private Hospital, and brokers’ sales center of rice, pulses and oil. In Quarter (5), Minyart wards lies in the Central Business Zone in Shwebo urban area. Almost of this area is the residential area, so it is the densely populated area of Shwebo.

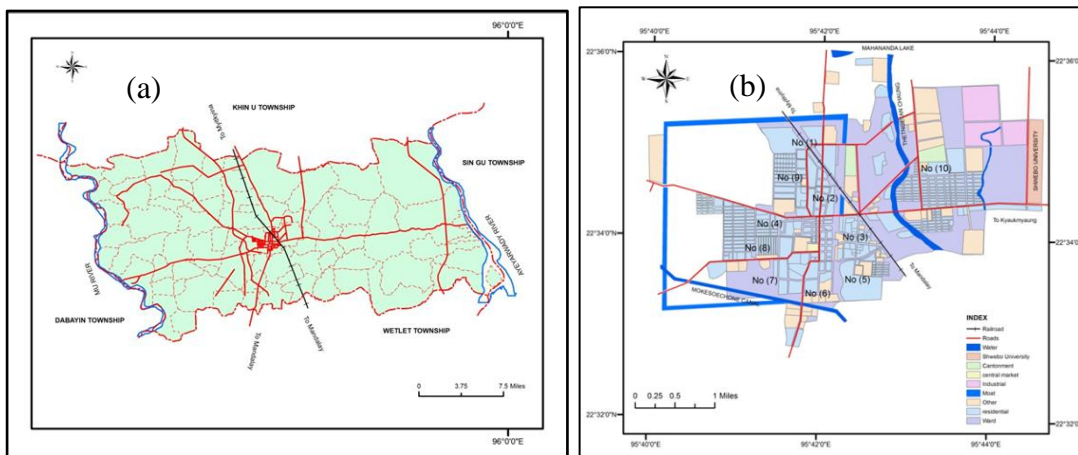


Figure (1.a) Location map of Shwebo

Figure (1.b) Location map of Shwebo

Source: Land Records Department, Shwebo

The lowest density of population in Shwebo urban area is Quarter (9), which has 13.81 persons per acre or 8865.46 persons per square mile. It includes Thettharpandaung block which is divided from Nemye 1 to Nemye 12 ward. It was extended in 1956 by Pyidawtha Plan. It is located on the northwestern corner of Shwebo where the least interest of dwellers due to stink and mud in raining. There are many cultivated area in the westward of this quarter. Therefore it is the sparsely populated area in Shwebo.

The resulting regression equation $y = 17.787x + 1546.1$, the determinant $R^2=0.5849$ and the correlation coefficient $R = + 0.8$ indicate that there is a very high degree of positive correlation between area and total population in Shwebo.

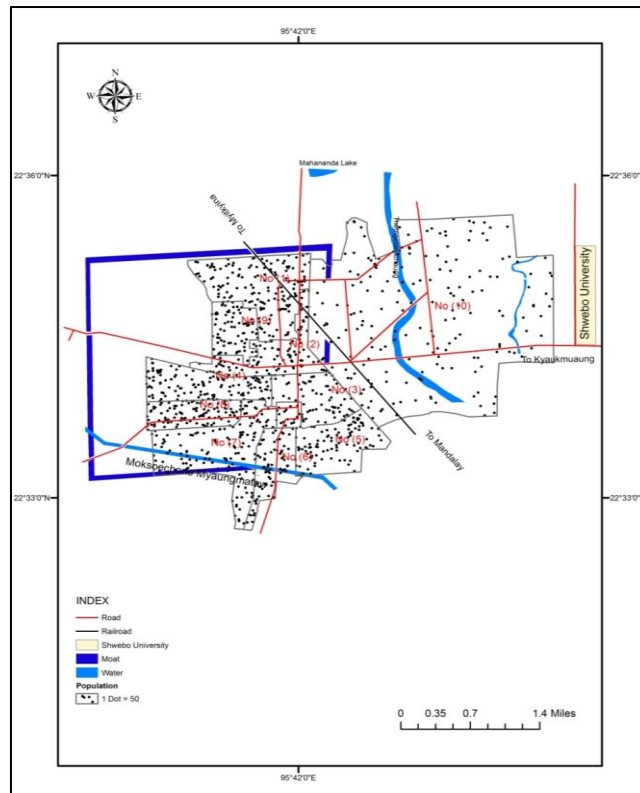


Figure (2) Population Distribution Map of Shwebo

Source: Immigration and National Registration Department, Shwebo Township

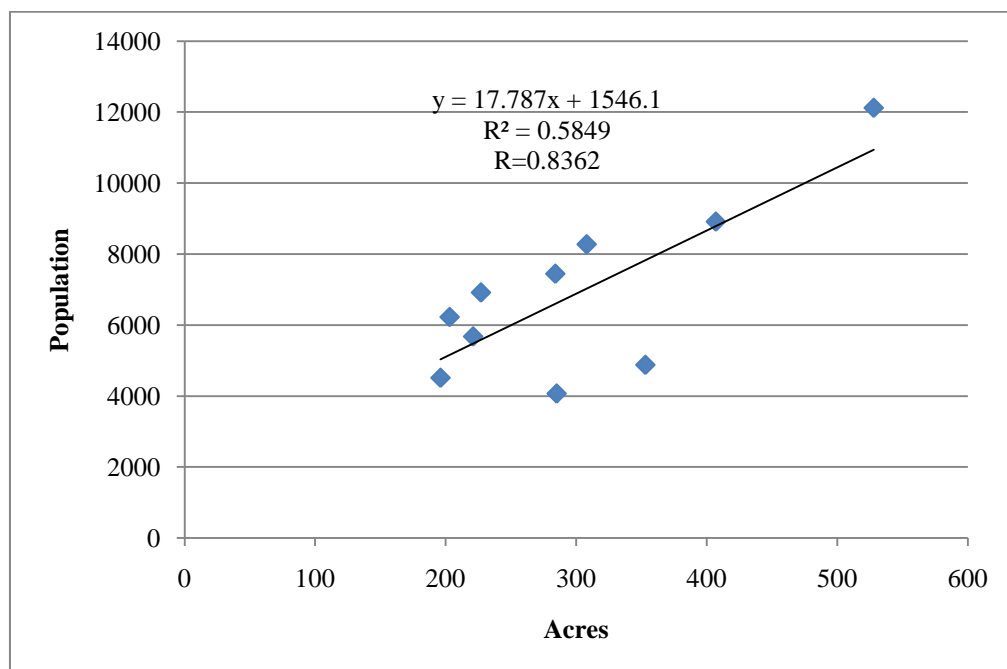
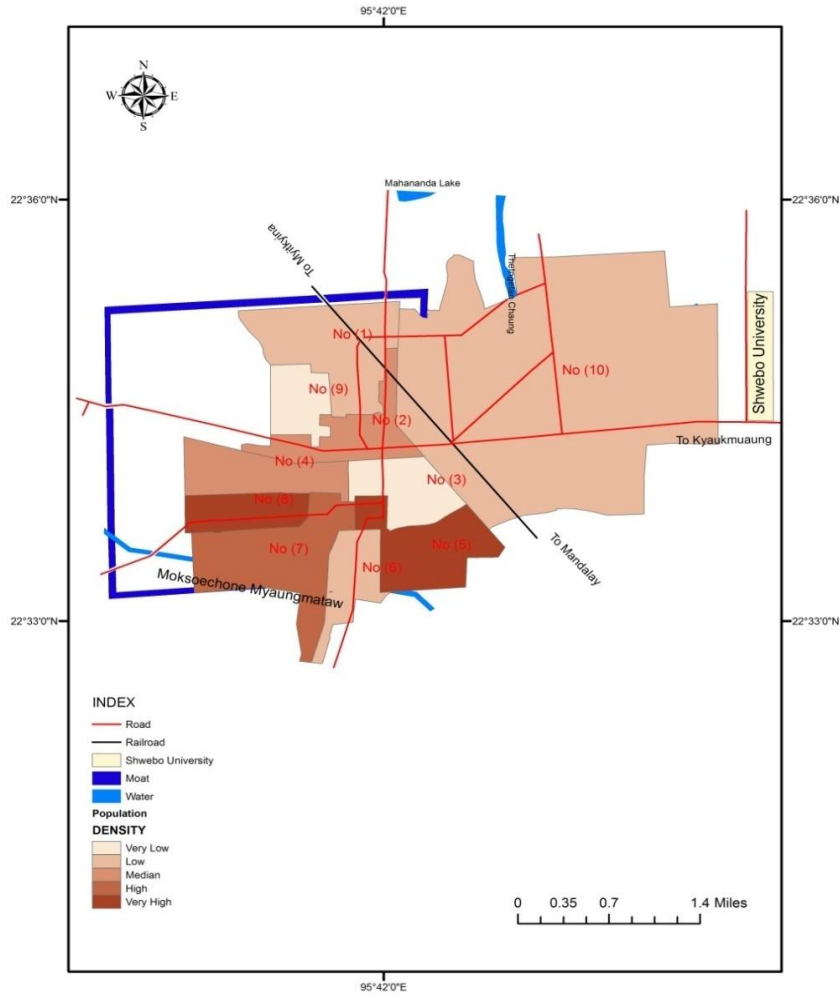


Figure (3) The Correlation between Area (Acres) and Total Population in Shwebo



Map (3) Population Density in Each Quarter of Shwebo

Source: Immigration and National Registration Department, Shwebo Township

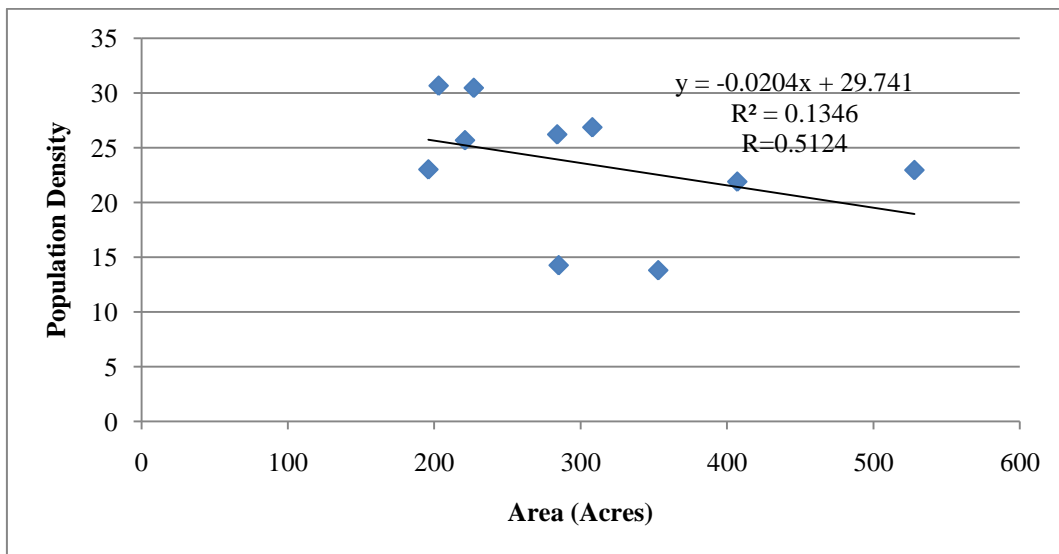


Figure (4) The Correlation between Area (Acres) and Population Density in Shwebo

Population Distribution and Density in Kyaukmyaung

Kyaukmyaung is composed of (4) quarters that including Kyaukmyaung, Yedaw, Nwenein, Letywe and Hnawbin villages. Kyaukmyaung has an elongated shape. It has an area of 19.46 square miles or 16839.6 acres. The total population was 10,703 persons, of which 5056 are male and 5647 are female in 2014. Its density was 550 persons per square mile in 2014.

In Kyaukmyaung, Quarter (1) is composed of Yedaw village. It has an area of 2407.47 acres or 2.74 square miles. It has a population of 1926 persons in 2014. Its population density was 702.92 persons per square mile in 2014. Quarter (2) is composed of the northern part of Kyaukmyaung village, has an area of 13224.03 acres or 15.3 square miles. The total population was 2883 persons in 2014. Its population density was 188.23 persons per square mile. Quarter (3) is composed of the southern part of Kyaukmyaung village and it has an area of 1158.1 acres or 1.37 square miles. The total population was 2950 persons in 2014. Its population density was 2153.29 persons per square mile. Quarter (4) is composed of Nwenein, Letywe and Hnawbin villages. It has an area of 50 acres or 0.05 square miles. It has a population of 2944 persons in 2014. Its population density was 58.88 persons per acre in 2014.

The largest population of quarter (3) lies in the center point and nearest to Kyaukmyaung port and market. Most people that live in this area are tradesman and vendors. They are mainly depending on purchasers upstream of the Ayeyarwady River. The smallest population of quarter (1) includes forest and cemetery and institutional land. It is nearest to Ma-au Reserved Forest. The resulting regression equation $y = 0.0114x + 2627.8$, the determinant $R^2=0.192$ and the correlation coefficient $R = + 0.3$ indicate that there is a low degree of positive correlation between area and total population in Kyaukmyaung.

Quarter (4) was the highest density of population in Kyaukmyaung. It is very small area with 50 acres or 0.05 square mile. This area is composed of Nwenein, Letywe and Hnawbin villages. Nwenein is home to the largest scale glaze factories in upper Myanmar. The reason for dense population was due to the well-known glazed earthen pottery works with very narrow passage of land along the Ayeyarwady and water transportation. It is one of the non-agro based economies in this area. According to the field observation, the industries of glazed earthen pottery are highly absorb the labour force and enough income by skilled labour and continuous trained and practice to people especially in young aged labourers with reliable salary rate proposals for future in skilled labour. Nwenein employs people to do everything from harvesting the river bed to in firewood for the firing process. The more decorative and smaller types of pottery are thrown by women. Quarter (1) was the smallest population and the lowest population density in Kyaukmyaung urban area. The reason for sparse population was due to the most area was forest, cemetery and institutional land. This area is also the mining sites of Dark Brown and Yellow Brown soil for raw materials of glazed pottery industry. The resulting regression equation $y = 49.318 x + 1015.8$, the determinant $R^2=0.131$ and the correlation coefficient $R = + 0.5$ indicate that there is a high degree of positive correlation between area and total population density in Kyaukmyaung.

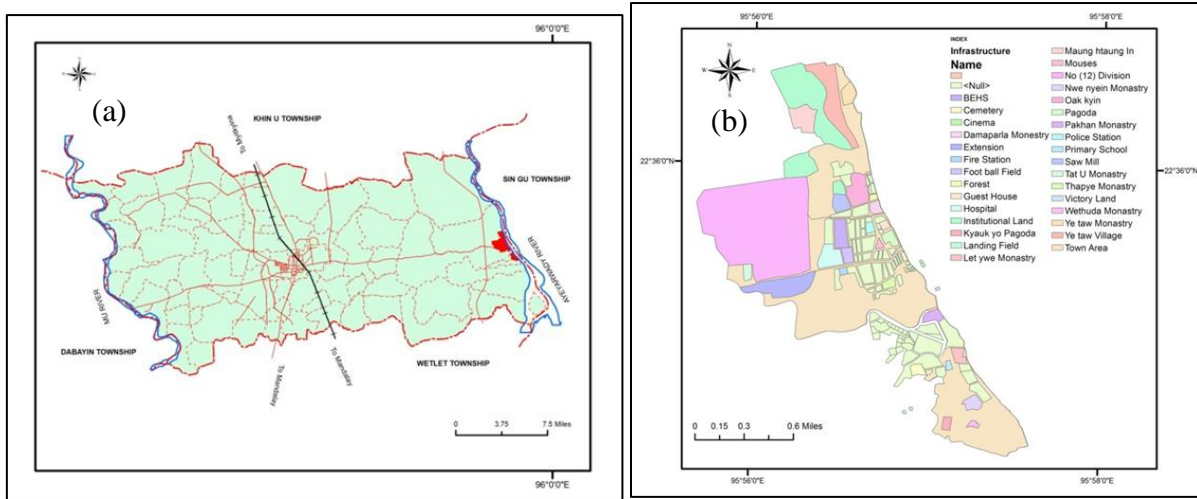


Figure (4.a and b) Location Map of Kyaukmyaung

Source: Immigration and National Registration Department, Shwebo Township

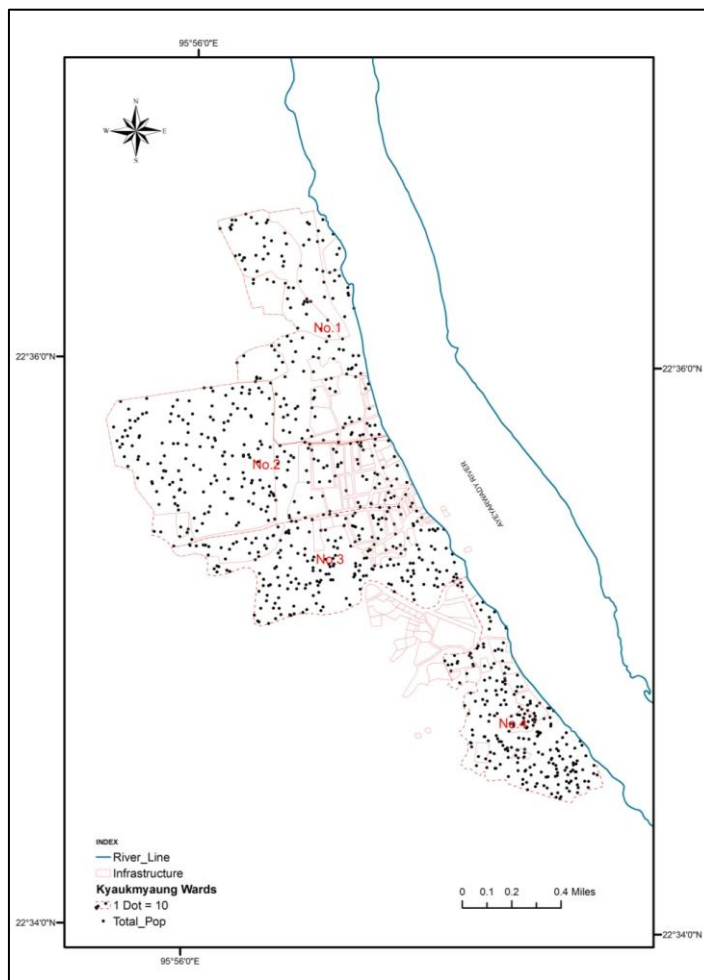


Figure (5) Distribution Map of Kyaukmyaung in 2014

Source: Immigration and National Registration Department, Shwebo Township

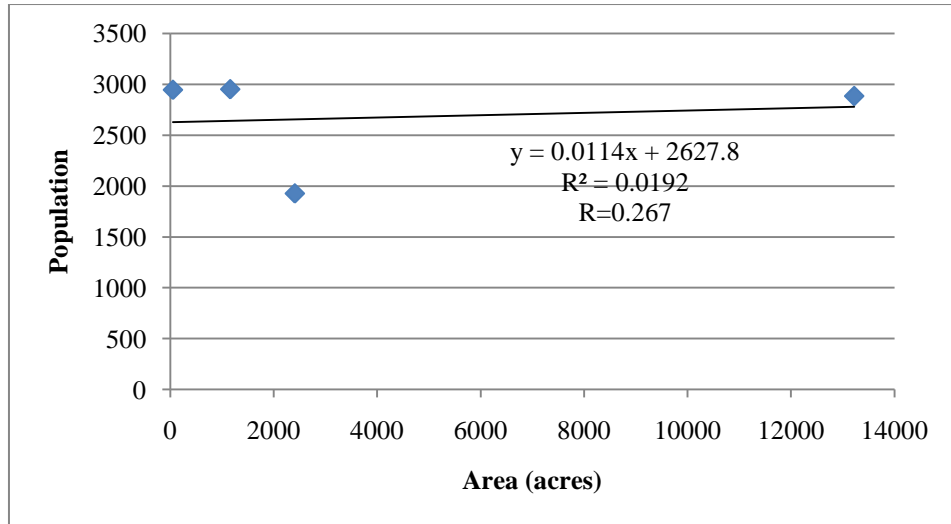


Figure (6) The Correlation between Area and Total Population in Kyaukmyaung

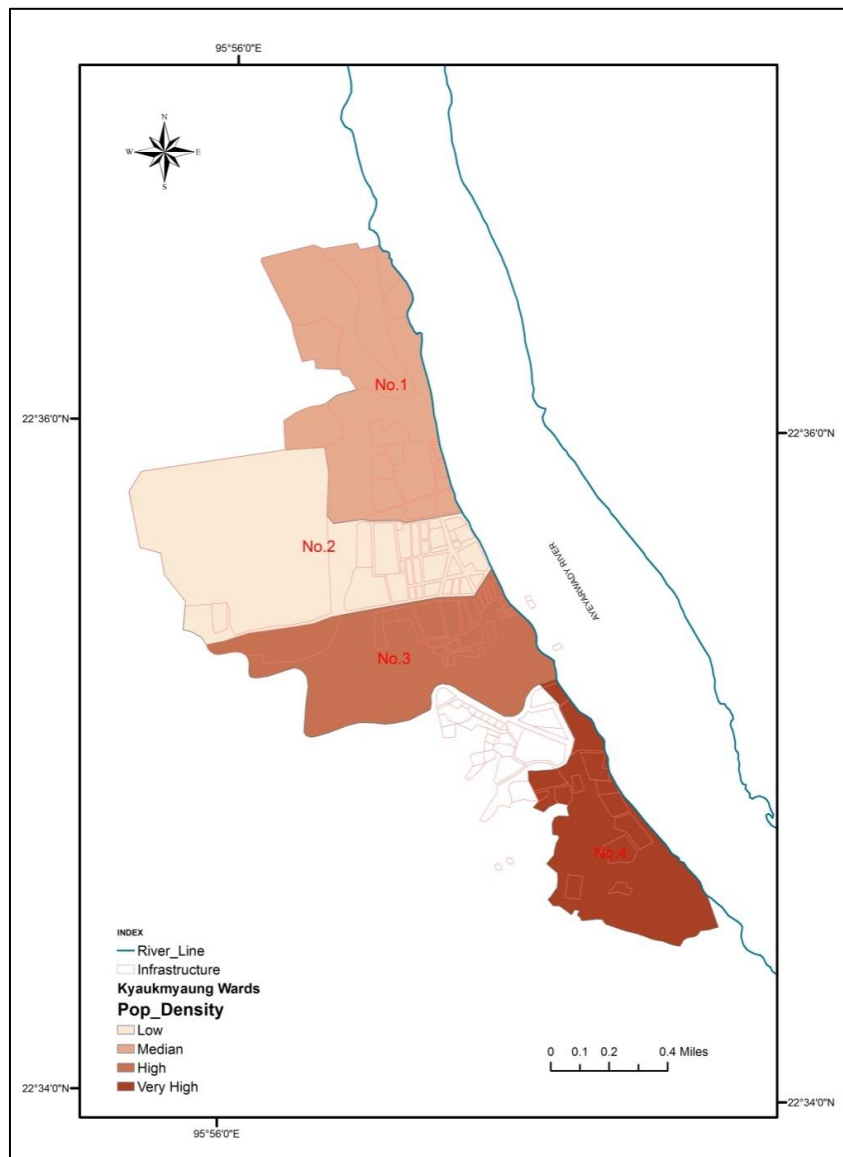


Figure (6) Population Density in Each Quarter of Kyaukmyaung (2014)

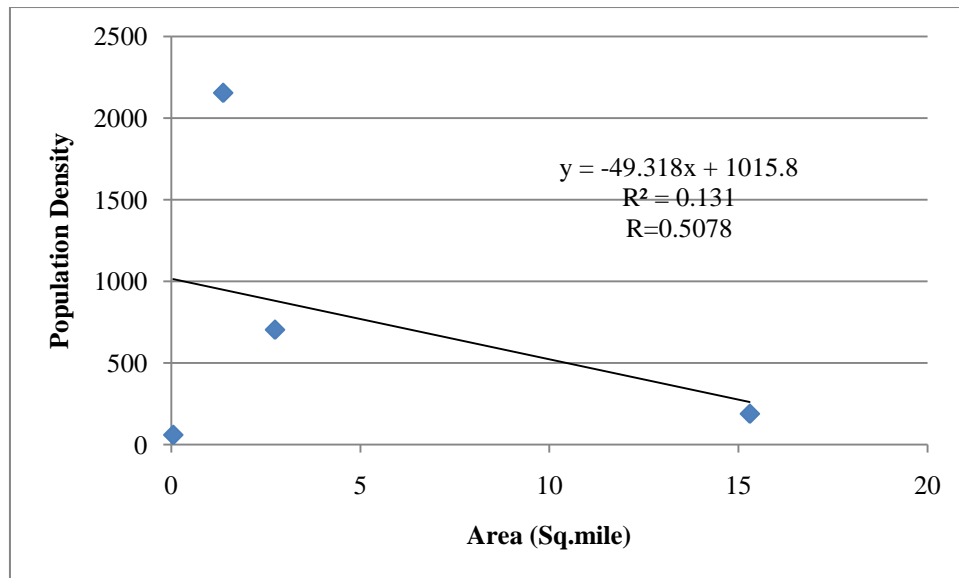


Figure (7) The Correlation between Area and Population Density in Kyaukmyaung

Conclusion

In Shwebo, the largest populated area can be found out with extended urban area, sufficient of water supply by artesian tube wells and accessible transportation roads, the Industrial Zone and Shwebo University environmental area. This area will be more and more developed in the economy and population of Shwebo. The smallest populated area can be found that it includes governmental office, official residences, recreation park, guest house of the chief of the state, desuetude airfield, football field, monasteries, moats, governmental nursery school, police station, electric power generation station, EPC office, army, court, philanthropic youth development camp, etc. The densely populated area lies on the south and southeastern corner of Shwebo Town and it has a small area. Almost of this area is the residential area, so it is the densely populated area of Shwebo. This area includes Shwebo General Civil Hospital, special clinics and Private Hospital, and broker' sales center of rice, pulses and oil. The sparsely populated area can be found on the northwestern corner of Shwebo where the least interest of dwellers due to stank and muddy in raining. There are many cultivated area in the westward of this quarter. Therefore it is the sparsely populated area in Shwebo. In Kyaukmyaung, the largest populated area can be found in the center urban area and it lies nearest to the port and the market. Most people who live in this area are tradesmen and vendors. They are mainly depending on purchasers upstream and downstream of the Ayeyarwady River. The smallest populated area can be found the areas of forest, cemetery and institutional land. The densely populated area of Kyaukmyaung is very small with 50 acres or 0.05 square mile and the largest scale glaze factories in the upper Myanmar. The industries of glazed earthen pottery highly absorb the labour force and give enough income to skilled labour and continuous training and practice to people. The sparsely populated area includes a forest, a cemetery and an institutional land. This area is also the mining sites of dark brown and yellow brown soil for raw materials of glazed pottery industry. There is a very high degree of positive correlation between area and total population of the urban areas of Shwebo.

Suggestion and Future Prospect

The distribution and density of population in urban areas of Shwebo Township vary distinctly with the effect of the socio-economic conditions associated with the physical features. Largely and densely population are caused by the promotion of local economy, education, health, job opportunities, security and transportation. Shwebo is the main producer of rice, peas and beans, and sesamum, especially in Shwebo Begyar, Shwebo Manaw, Pigeon pea and Green gram. These are sold at Mandalay, Yangon and exported to other countries such as China, India, etc. Shwebo is connected with north to Kachin State, west to Depayin Township, east to Singu, Mogoke, Mandalay Region, south to Mandalay and Yangon, southwest to Monywa, Sagaing Region and the whole of Myanmar by railway, motorway and waterway. Therefore there are also the most famous products of Glazed Pottery and Seikkun Longyis. Seikkun Longyis and Glazed Pottery are distributed to the whole country. Kyaukmyaung is the transit area, and so distributes variety of pulses, treacle, kipper, and salt fish, etc. that are produced from Katha, Htegyint, Tagaung, Kyanyet, etc, transported by waterway. So Kyaukmyaung is very popular. It will certainly affect the development of Kyaukmyaung to become an urban area with Headquarters of the sub-township. Ayeyarwady Bridge (Yadanatheinga) has caused a better transportation and an economic development which continue to develop the socio-economy in this area. Then urban area of Shwebo Township will continue to more migrate by rural population from Shwebo Township and other areas. Therefore urban areas of Shwebo Township will be more and more populous area in future.

Acknowledgement

I would like to express my special thanks to Dr. Myint Swe, Rector, Taunggoke Degree College for prompting to write this research paper. I have referred in my reference sources for which I owe their indebtedness to the original authors and the research.

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မြို့နယ်အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန(၂၀၁၅): ဒေသဆိုင်ရာအချက်အလက်များတင်ပြချက်အစီရင်ခံစာ၊ ရွှေဘိုခရိုင်၊ စစ်ကိုင်းတိုင်း။