

**1.1. CHANGING URBAN AND LAND USE PATTERN**

**Change in Land Use Pattern in Mandalay Urban Area:  
A Case Study of Chanmyathazi Township**

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**Abstract**

This research paper focuses on the changes in land use patterns and land ownership in Chanmyathazi township, Mandalay. The proliferation and opening of economic development of the Myanmar government in border trade systems leads to attractive commerce places for the investors in Mandalay city. The Myanmar government has a good policy in land access and tenure for its citizens. Many Chinese and its related ethnic groups migrate to Chanmyathazi Township and they buy the lands with high prices from the local land owners even though the government's official system of land value has reasonable prices. Chinese and its related ethnic groups own most of the land in Chanmyathazi Township and they build very big modernized houses which is totally different from the houses of the older residents. Varieties of economic activities are also different between the ethnic groups. This research paper discovers that land size, land use patterns and land ownership are changed and shaped by the incoming Kokhang Chinese and Monewun ethnic groups. These issues motivated this research project in Block E/2 ward Chanmyathazi Township, Mandalay, Myanmar. Moreover, these ethnic migrants have influenced the urban land-use pattern of the study area, which could be reflective of the general urban morphology of Mandalay City.

**Keywords:** Land use pattern, Land ownership, Kokang Chinese, Monewun Chinese

**1. Introduction**

This research paper argues that the land use patterns are changed in Chanmyathazi township of Mandalay when the government opens the border trade system as national economy development and civilization project. It becomes an attractive place for major investments of economic development. Mandalay is a trading hub for upper Myanmar and international trade center with China, India and Thailand. Mandalay becomes as a main transportation zone, economic zone, industrial zone, international airport center and tourists destination center. These all issues encourage the number of new comers to move and settle in Mandalay. For this situation, land acquisition becomes the fundamental requirements for the new settlers in this land. Chinese, Kokang-Chinese, Monwun-Chinese and Shan Chinese, came to own greater shares of land than the local people in the study area. In this research Block E/2 ward in the Chanmyathazi Township of

Mandalay City is used as a case study area to describe the impact of different ethnic immigrants on urban land use.

The main aim of this research is to better understand whether the new comers or immigrants ethnics plays an important role or not in the physical development of city and in urban land ownership pattern. There are four main objectives in follows, to study the changes in the urban land-use pattern and land lot ownership pattern, to investigate the impact of urban development policy on urban morphology, to search for relationship between migrated ethnic communities and urban land use, to find out the immigrant ethnic communities in the study area.

### **1.1 Research Questions**

1. Who are the most occupants in the study area?
2. Where are occupied the study area by new comer ethnic groups?
3. How does the land lot ownership pattern change?
4. What are the impacts on the urban land use?
5. How has the government development policy on urban land use of Study Area?

### **1.2 Research Methodology and Data Collection**

In the Mandalay area, there are large numbers of wards and housing in the Chanmyathazi Township. And varieties of ethnic group are also in this area. Among them, as a case study, Block-E/2 ward of Chanmyathazi Township was choice to focus on urban land use pattern and land owner change. The data collection methods will be randomized sampling and open interviews and observation method. The sample size will be about 100 households. Samples are collected focus on ethnic community and place of land lots such main road and inner roads. Samples will be classified into the four group such as the Chinese and its related ethnic group such as Kokang Chinese, Shan Chinese, Monwun Chinese, Panthay and Chinese Burmese. The Burmese and its related ethnic groups are Bamar, Burmese Chinese, Indian Burmese, the other national races of ethnic groups and other groups.

### **1.3 Research Scope and Limitation**

In Chanmyathazi Township, there are 13 wards. The exact study area is located within the Myothit 3 Ward, No. E-2 Ward which is one blocks of the resettlement areas for fire victims. The study area lies between lat 21° 56' 13" N and lat 21° 56' 22" N and between East longitude 96° 6' 28" and East longitude 96° 6' 39" It is about 13.85 acres wide and situated on the corners of 62 Main Road and Ngushwewa Road. It is studied based on the morphology of study area between ethnic groups. Therefore, the study area was purposely chosen to find out the relationship between immigrants ethnics and urban land use pattern changes.

### **1.4 Literature Review**

In this study, the other research papers have reviewed with the migration and urban land use changes. One *is the Migration and Land Use Change in Europe: A Review* was made by Simon Bell, Open space Research Center, Edinburgh College of Art, Lauriston Place, Edinburg EH9DF, UK. He described the migration within Europe and between Europe and other parts of the world is major driver of population change and has effects on land use. It reviewed historical trend and actual patterns of migration. It suggested that land use change caused by different types of migration and implication of migration on land use change need further research.

John R. Logan and alliance, University of Albany, was described the immigrant enclave model in which ethnic neighborhoods in central cities serve relatively impoverished new arrival as a potential base for eventual spatial assimilation with the white majority. The title is *Immigrant Enclaves and Ethnic Communications in New York and Los Angeles*. It built immigrant enclave model in which ethnic neighborhoods in central cities serves relatively analysis of the radical patterns of largest immigrant group in New York and Los Angeles.

The title is *The Effects of Immigration on Urban* which was done by Communities Ranklin J. James and two are University of Colorado at Denver. They find out the impact of immigrants on large US cities. The evidence shows that immigrant have not reduced the job opportunities of US natives and that immigrants have strengthened a number of section of big city economies including small business.

*Base line analysis: urban form and infrastructure in the UK* set out a baseline analysis of the UK's urban form and infrastructure in the post war period.

Raymond Breton described about *the Institutional Completeness of Ethnic Communities and Personal Relations of Immigrants* with focus on the direction of the interpersonal relations of immigrants. It effect interpersonally integrated within the native community, within his ethnic community or within a group of immigrants of an ethnicity other than his own. It indicate that the social organization of ethnic communities wide variation among them.

*Urban Growth and Its Impact on Land Transformation in Medium Sized Urban Centre of Kashmir Valley* was explored three authors including Mohammad Sultan Bhat University of Kashmir about the land use and land cover change and has been reshaping societies all over the world. As a case study, the Kashmir valley, urbanized regions in the Himalayas was studied. This research analyzed the urban growth has mostly occurred at the cost of agricultural land, wet land and vacant barren land. It indicates the land available per person.

The land as a Free Gift of Nature, Furnivall J.S. was studied to know the history of land in Myanmar. "Urban morphology is the study of the form of human settlements and the process of their formation and transformation. Urban form is the study of the physical characteristics of towns and cities resulting from an evolutionary process of urban activities and planning action. Human settlement is the totality of human community whether city, town or village with the entire social material, organizational spiritual and cultural element that sustains it. Urban structure is the physical complexity of various scales, from individual building, plots, street-blocks and the street pattern" (Urban Morphology by Naibei Peter University of Nairobi - Kenya).

Temporal Changes in human Landscapes of Mandalay City, Maung Win, PhD dissertation (unpublished), 2008, had done about human settlement changes. It indicate the change of human characteristics.

Win Myint Oo has done in his PhD dissertation (unpublished) about the Temporal and Spatial variations of Land Utilization Pattern in Mandalay City base on the growth of urban land use in Mandalay City. The research indicate to the development of Mandalay City the research support to

my study concern with the historical background of Mandalay City and current growth. And also other requirements factors can be referred as sources. And land use definition was described in his paper. According to U Win Myint Oo, he quotes from Mandal, it says that "Land use is the use actually made of any parcel of land, house, apartments and Industrial location are land use categories, whereas the term residential, industrial and agricultural refers to a system of land utilization implying roads, neighbor -hood retail and service activities as well as location of industries, and the carrying of agricultural pursuits. In a rural area, tree, crop or row crop would identify land use, whereas orcharding, truck farming and grazing indicate a system of land utilization". In U Win Myint Oo quotation from Mandal, it explains that "Land use is conditioned by the association of two sets of factors – first, physical factors such as geology, relief features, climate, soil and vegetation which limits the use capabilities of land and secondly, cultural factors which include both economic and institutional factors. Cultural factors represent the length of occurrence of the area, demographic and socio-economic conditions, institutional framework and the technological. In U Win Myint Oo quotation from Fellmann/Getis/Getis, Human Geography: Landscapes of Human Activities, 1990, it explain that "Social values and human behavior play a great role in the reduction of land use pattern. Land use varies according to the differential demand and requirements of the people over a piece of land. For this fact, the land use pattern, as well as the amount of land utilized for a particular purpose, and often the intensity of development is constantly under change, according to the changing needs of the community".

Moreover, U Hla Kyaw studied in his Dissertation about the land value and land revenue. The title is *Determination of Land value Classes and Its Application in Urban Planning of Mandalay City*. His land value and land revenue related to the land occupants and types of land plots as a source in the urban morphology changes especially in immigrant's impact on urban land use. According to U Hla Kyaw, 2007, pp 29. that described, the government has laid down urban development plan for Mandalay city, such as the extension of urban residential lands; replacement of old markets with new, modern markets; building housing estates; establishing industrial zones; the construction of new hospitals specialist clinics and teaching hospital, the opening of Dental Institute, Nurse Training Institute and the establishment of gardens, playgrounds, parks and recreation centers, and Zoo. Land values often rise if there is construction of roads, the upgrade of present poor earth road to graveled or metaled or tarred or concrete road, the connection of electricity, laying water pipe lines, the establishment of academic institution, the opening of health care facilities, the opening of any kind of recreation facilities and the opening of economic and commercial centers and so on. All these are the outcome of government policy. The change of government policy can also bring down land prices and land value.

Tin Moe Lwin observed that *social Characteristics and Migration Patterns of Households Residing in the New Extension Townships of Mandalay City Myanmar, after the Economic Liberalization of 1988* focus on the social characteristics and migration patterns of dwellers in the new extension township of Mandalay City. He described that the spatial extension of Mandalay City after the 1990s is type of over urbanization due to the FDI.

Dr May Thu Naing studied on migration process of Mandalay City, the title is a *Geographic Study on Migration Process of Mandalay City*. In this paper the result find out the migration process is mainly

depend on various reasons. This paper was not focus on ethnic groups. However, it was supported to the migration to the context of Mandalay City partly on study.

Above those literatures reviewing some are not directly related to my research but they support to idea and knowledge for my research. Some are directly related to support the background of study area. They find out about the growth of Mandalay City development and growth with population increases. In this paper the influences of different ethnic group on urban land use was focus base on history of Mandalay City and choose the study area as a case study.

## **2. Background Information**

Mandalay was established as the capital of the country by King Mindon in 1857. In 1885, the British ruled the whole country of Myanmar. The British Colonial government divided the built up area of Mandalay into four administrative units - the Eastern Territory; Western Territory; Southern Territory; and Northern Territory. Mandalay was now composed of the five townships due to the order of Ministry of Home Affair 10.12.1992. These are Aungmyaythazan Township, Chanayethazan (U Win Myint Oo, 2010, pp 25). During the period from 1980 to 1984, as the City met with the incident of fire for twice so the 7000 home were destroyed by the fire hazards. Before 1986, the victim of the fire hazards and squatters were laid out to resettle in the plot of land in the new extension areas and Pephyugone village within the Chanmyathazi Township (U Win Myint Oo, 2010). The land plot size is standardized at 40\* 60'. In 1986, some of the government employees began to be allotted house plots in Myothit in order to compensate for their low salaries (Tin Moe Lwin, 2010, pp. 114). It is partly concerned to the local people moving out to the next area and also attracted to the immigrants came into the study area. Mandalay City is located at the Central Part of Myanmar. Chanmyathazi Township is one of the townships in Mandalay City, southern part of the center of the city. The study area is located in the Chanmyathazi Township. It lies between lat 21° 56' 13" N and lat 21° 56' 22" N and between East longitude 96° 6' 28" and East longitude 96° 6' 39" It is situated at the corner of 62<sup>th</sup> Road and Shwe wa Htun Road. It has an area of 14.83 acres. The Study area is Square shape. It is bounded by Zalatwar Street on the south, by the Shwe wa Htun Road, by 64<sup>th</sup> Road on the west and by 62<sup>th</sup> Road on the east.

### **2.1. Social Factors of Study Area**

The population ethnic and land utilization pattern were changed by the migration of different ethnic group. The size of population composition is also important in the urban land use pattern changing. The total number of population are about (903) in 2015 (Ward Administration Office) There are male (364) and female (539) persons. These population compositions divided into two groups such as under eighteen years and over eighteen years. Under eighteen years group has about 202 persons and over eighteen years group has 701 persons in the year 2015 (Ward Administration Office). In the years 1999, the total population was 634 persons and there were male 314 persons and female 320 persons Immigration and Man Power Department of Chanmyathazi Township). The population growth rate is 2.94% from 1999 to 2015.

2<sup>ND</sup> INTERNATIONAL CONFERENCE ON BURMA/MYANMAR STUDIES  
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MAP 1 LOCATION OF THE STUDY AREA IN MANDALAY CITY

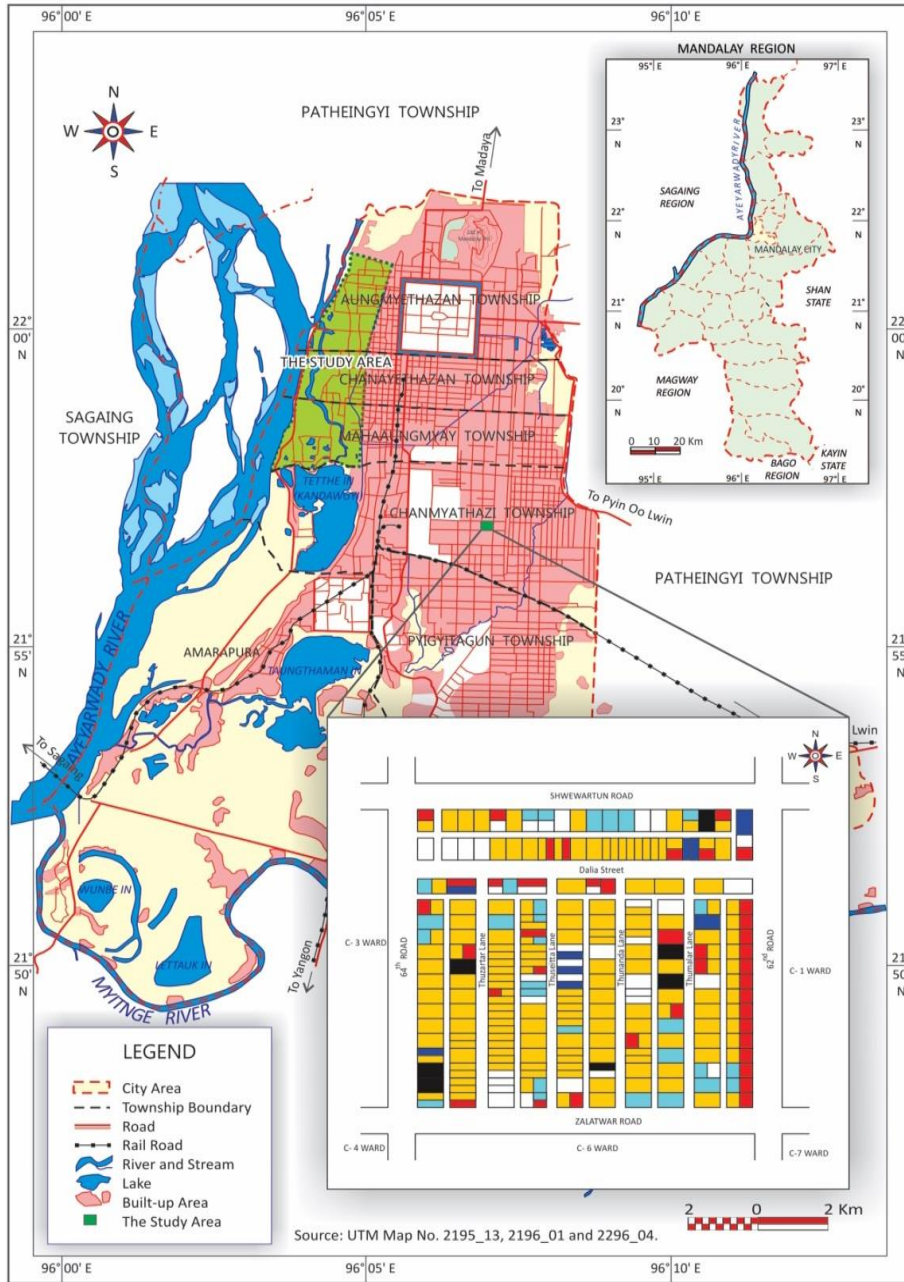


Table 1: Total Population of Study Area

Year	Total population	Male	Female
1999	634	314	320
2004	859	418	441
2010	878	434	454
2015	903	362	541

Source: National Registration and Manpower Department, Chanmyatharzi Township



Figure 2: Total Population of Study Area (1999-2015)

### 2.1.1. Ethnic and Religions

There are large number of ethnic in study area such as the Burmese, the Chinese, the Kokang Chinese, Monwun Chinese, Burmese Chinese, Kayin Chinese, Kachin Chinese, Shan, Palaung, Lishu, Indian, and Pakistani. The various ethnics were divided into four groups base on type of individual ethnic in this study area such as Burmese and its relative group, the Chinese and its relative group, the other national ethnic and other groups. According to table (3) the first largest group is Burmese, the second largest group is Chinese and its relative ethnic and the other national ethnic group is the third largest community in the study area table 2.

Table 2: The total population of ethnic groups (2015)

Ethnic	Male	Female	total	%of total population	Religions
Burmese and its relative ethnic group	218	339	557	62	Buddhist
Chinese and its relative ethnic group	105	160	265	29.34	Buddhist
National ethnic group	25	28	53	6	Buddhist/Christian
Others	14	14	28	3	Islam/ Hindi
	362	541	903	100	

Source: General Administration Office of Ward

### 2.2 Types of Occupation with Ethnic Group

In the study area, there are varieties of economic activities, food stuff preparing, textile and clothing, cosmetics shop, beauty paler training center, car workshop, car cleaning shop, plastic commodities shop and others. These types of economic activities are grouped into three types of occupations, Business occupations, Regular income occupations and Daily wages occupations. According to table(3), in the Burmese ethnic groups, the business occupations types are 39.21%, regular income types are 31.37% and daily wages types are 29.41%. In the Chinese and its relative ethnic groups, the business occupations are 100%. In the National ethnic groups, the business occupations is 75% and regular income is 25%. In the Other ethnic groups are business occupation is 8.88% and regular

income is 11.11%. According to the occupation results, the land use pattern and housing type is changed and is different between the ethnic groups.

*Table 3: Percentage of types of occupations*

Ethnic	Households	Business	% of business	Regular income	% of Regular income	Daily wages	%ofDaily wages
Burmese ethnic group	51	20	39.21	16	31.37	15	29.41
Chinese ethnic group	32	32	100	0	0	0	0
National Ethnic	8	6	75	2	25	0	0
Others	9	8	8.88	1	11.11	0	0

*Source: Field Survey*

### 3. Context of Government Development Policy

In 1988, the State Law and Order Restoration Council reformed as the State Peace and Development Council, implemented market liberalization policies. (Tin Moe Lwin, 2010, Quarterly Journal of Geography). In 1996, Myanmar had signed three border trade agreements with India, Thailand and Bangladesh. The establishment of border trade related with China in 2006. (Daw Zin Zin Naing, Department of Applied Economics Yangon University of Economics). MCDC carried out the Mandalay City development policy all Mandalay five townships including Chanmyathazi Township. The water distribution carried out in five townships in the year 1995 to 1997. Moreover, 30 tube wells dig for Chanmyathazi Township, Pyigyithgun Township by aid of KOICA and MCDC built roads (Government and Policy, office of prime minister, modins.net). Land value and revenue classification policy laid down in the year 1996, (U Hla Kyaw, pp.34). Among the responsibilities are the establishment of new towns (Law of 1992); the planning within the boundary of MCDC and the execution of works such as water sanitation, public health, street lighting, Sewerage, construction and repairs, shifting, replacing and demolition of encroached houses, buildings and settlements, etc. In the 1998, the University of Dental Medicine and University of Nursing Medicine were built in the Chanmyathazi Township. MCDC has announced to build the houses strongly where the land lot's owners for the city development in 2006.

#### 3.1 Context of Land Value and Land Tenure

In the year 1859, the king usually granted three kinds of lands such land for residence land for subsistence and land for cultivation. The people of the kingdom could own the land by right of first slash of cutlass (Damau-cha) which later became and known bobabaing the land owned by forefather after many generations had worked and owned such lands. (U Hla Kyaw, 2010, pp.29)

In colonial period, the state owned all the land in the country, the private ownership of the land with the transferability of it from one person to another land revenue system was introduced in the city by government. Mandalay municipality had done the classification of town land into the bobabaing land, the grant land and the leased land which all are residential lands (<http://books.google.com.mm>) in urban, municipal areas under various Town and Country Acts, land parcels are registered. Grant land is owned by the government and exists almost everywhere in cities

and towns. Grant land is at the disposal of Government may be disposed of by grant or lease to any person or entity for a stipulated period which could range from 10 years, to 30 years to 90 years etc., which is extendible upon application. Grant land is transferable and lessee owner is legally bound to pay land revenue to the state. During the lease period the government can take back this land for public purpose in accordance with the Land Acquisition Act, in which case the owner is entitled to compensation (Preparing Mandalay Urban Services Improvement Project, Issue A, 15/02/2015).

According to U Hla Kyaw, 2010, pp. 34, after 1988, State Law and Order Restoration Council (SLORC) government recognized the outright ownership of land by its citizens. Land value system was classified by government system and by marketing system. Government system comes out of the land revenue system of Myanmar based on the settlement of the rate of revenue. The government land value system is the assessed value for taxation. In the marketing system, the price of land parcel value is determined by the developers, dealers and broker's base on the location, extent, accessibility and the tenure. The value of land in Chanmyathasi Township varied to their locations. The Study area includes Myothit 3 quarter, where the value varied in one square feet to 375-900 kyats according to Mandalay City Development Committee (U Hla Kyaw, 2010, pp. 45). The prices of land are also changed temporally and spatially.

### 3.2 Migrated Households of Study Area

In the study area, a few number of households are the origin of land owners and old residents. The migrated households of study area are shown in table (4) with ethnic groups. 47.05% of Burmese and its relative groups are migrated from the inner city of Mandalay City. 23.52% are migrated from Inner Mandalay Region and 29.41% are come from other regions. In the Chinese and its relative groups, 93.75% migrated from Shan State and Kachin State. 6.25% are come from the inner Mandalay City. They come from outer part of Mandalay City and Shan State because of their market economy. According to the registration list of form ten, Burmese groups moved out to the next places where the land is less value than the study area, such as Kanthayar Myothit, Htoon tone, fringe of industrial zone 2 of Pyigyitagong Township. 15% are moved out to the other towns like as, Yangon City, Sagaing Town. They are Burmese groups. 1% are Chinese group who groups are replaced near and around the study area due to the locational choice.

Table 4: Percentage of migrated households with ethnic communities

Ethnic group	The last places				The New Places		
	Inner City of MDY	Inner MDY Region	Other Regions	Shan/ Kachin State	the less value places	Other Cities	Around the study area
Burmese	47.05%	23.52%	29.41%	0.00%	60%	15%	13%
Kongkan-Chinese	6.25%	0	0	93.75%	1%	0	7%
National ethnic	13%	38%	0	50	0	0	0
others	22	44	33	0	2	0	2

Source: Field survey

### 3.3 Reasons for Locational Choice of Households

As a result of structure open ended interviewing, some of immigrants have moved to the current homes since 1999. Some are lived in 10 years at this area. The main reason for buying their house are land prices, better location, investment, their children's school and others. The decisions of locational choice are varied concerned with the immigrant ethnic community on the factors such as for price 49%, for suitable of residents 34%, for an investment 8%, for better location 3%, for children schooling 6%, job opportunities 2%. The respondents can get the land purchasing under three ways, government development policy planning way which is the people who live the land from directly government permitting by approving with note. They can sell or rent to the land as their right of land tenure. The second way is the treaty with money (promissory) from the original or primary owners who hold to their land permitting note. The most occurrence way, today, it is the real estate agent way that is land and housing service agent they give the information of land and house places and value and service to meet the purchaser and the seller.

Table 5: Reasons for location choice of households

Reasons	Price	%	Suitable resident	%	An invest-ment	%	Better location	%	Children schooling	%	job opportuni-ties	%
Burmese	40	82	12	35	2	22	2	50	3	50	0	0
Kokang -Chinese	5	10	16	47	5	56	1	33	2	33	0	0
Other national ethnic	4	8	6	18	2	22	0	17	1	17	2	100
Total	49	100	34	100	9	100	3	100	6	100	2	100

Source: Field survey

## 4. Impacts of Urban Land Use Pattern Changes

Land use is the surface utilization of all developed and vacant land on a specific area at a given time and space. Land use is the use actually made of any parcel of land, houses, buildings apartments and industrial locations are included in land use categories. According to the government development policy and land use and land tenure policy, the study area was pushed to change the land use pattern and land ownership pattern by ethnic households. Furthermore they attracted to the population migration. In this change, there are spatial and temporal variation and space differences on urban land use of study area and also land size differences of ownership and Housing types are also changed and varied by time and by ethnic group.

### 4.1 Temporal Changes of Land Ownership Pattern with Ethnic Household

There were primarily lands parcels 190. The migrated households 12.5% of the land lots was Chinese and its relative ethnic group. the others were 6.25% household and national races were 3.12% of households in the year 1999. According to the Market economy, the people who are Burmese 78.37%, Chinese group 16.07% and the others 3.3% gradually migrated and settled in the study area in the year 2004. In the year 2010, the settlement households were increased about 140 households they are Burmese 67.33%, Chinese 26%, national races 3.3% and others 3.3%. Currently, there are

totally 187 households, Burmese 117 hh (62.57%), Chinese 50hh (26.74%) and the others 9 (4.81%) households and national races 8 (5.88%) households. In 2015, the total land parcel or land lots are became 225 land lots however this land are not the original size. The original land lot size are 2400sq/ft and out of land size are 1200 sq/ft. Land lot size was changed with increase of population and also land ownerships were changed by ethnic groups. According to the figures, the ethnic Chinese groups are gradually influence to the study area on the main places. The Burmese groups owned inner of study area and half of land lot area are owned because of their earning. Finally, Most of land ownerships are Chinese groups who became increased gradually in the year 2016 according to the figure (9).

Table 5: Temporal changes of ethnic households

Ethnic-Groups / Year	1999	%	2004	%	2010	%	2015	%
Burmese	50	78.13	88	78.57	101	67.33	117	62.57
Chinese and relative ethnic group	8	12.5	18	16.07	39	26	53	26.74
national Ethnic	2	3.12	2	1.79	5	3.3	8	5.88
others	4	6.25	4	3.57	5	3.3	9	4.81
total	64	100	112	100	150	100	187	100

Source: National Registration and Man Power Department, Chanmyathazi Township



Figure 3: Land ownership pattern by Ethnic Groups (1999)

Source: Field survey



Figure 4: Land ownership pattern by Ethnic Groups (2004)

Source: Field survey

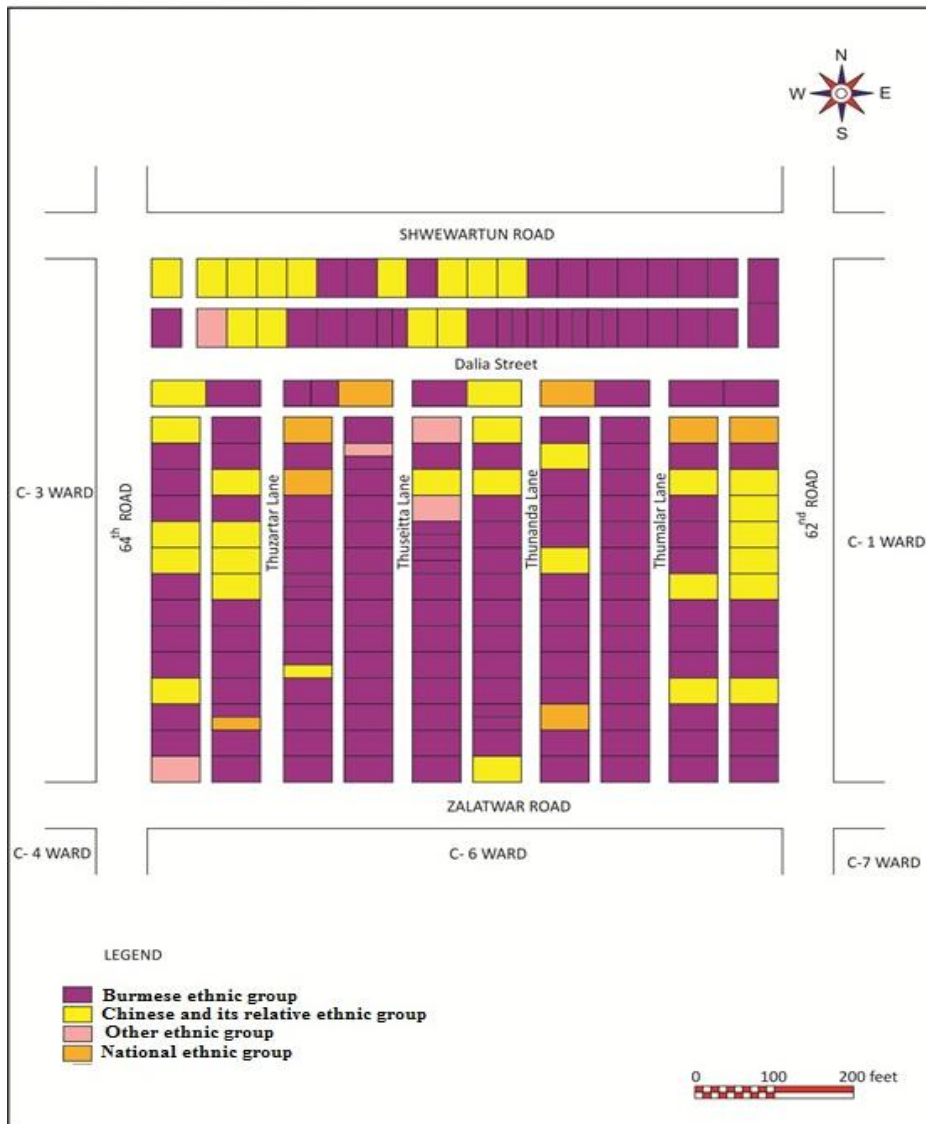


Figure 5: Land ownership pattern by Ethnic Groups (2010)

Source: Field survey

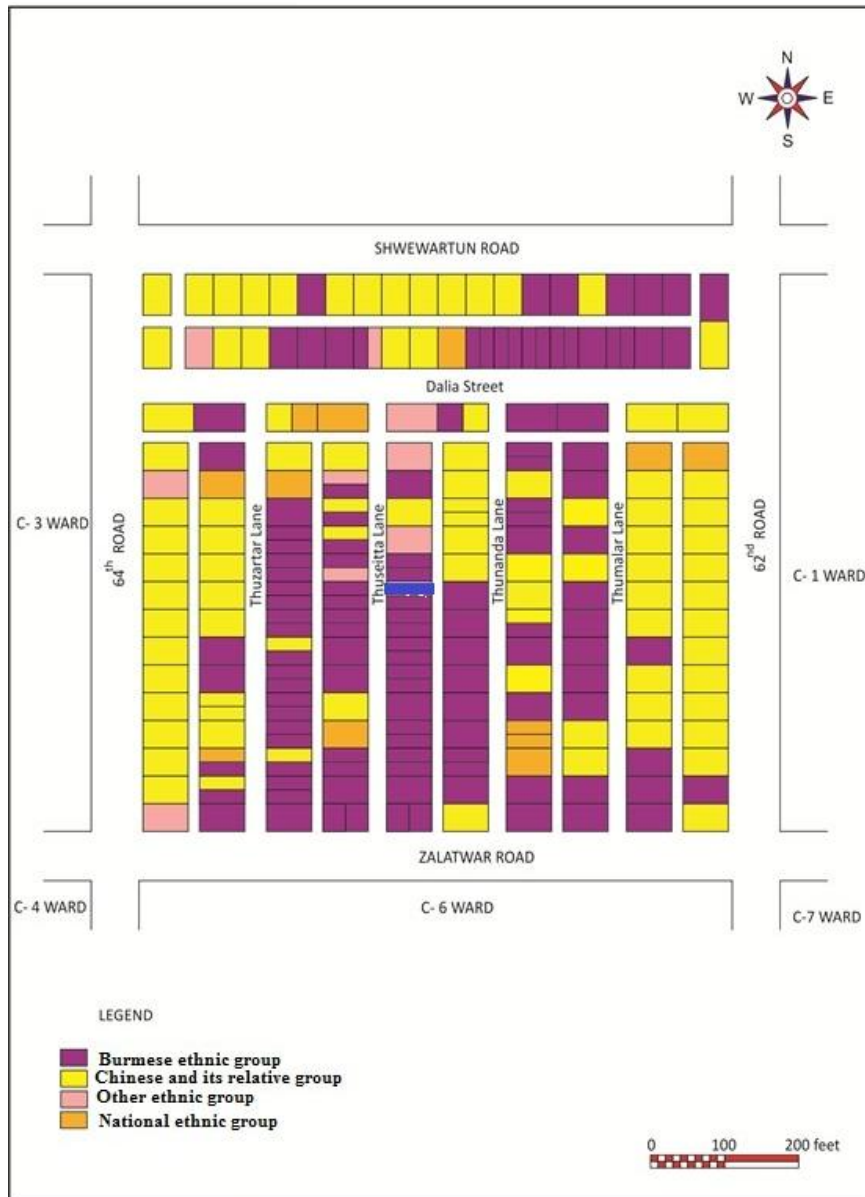


Figure 6: Land ownership pattern Ethnic Groups (2015)

Source: Field survey

**4.1.1 Land Ownership and Land Lots by Ethnic Group**

In the study area, land tenure is categorized base on the ethnic. A person can buy the land if he or she is the nationality in the country. By this way, the land ownership was changed by different ethnic groups. According to the year 2016 data, the largest land ownership is the ethnic Chinese (49.47%) and the second largest group is the ethnic Burmese(41%) according to field survey, the Chinese group possessed one household in two land lot of 40\*60(2400)sq/ft. Most of Burmese group owned the land lot 20\*60(1200 sq/ft) in one household. The Burmese group owned the land lot (40\*60) (2400 sq/ft) 27 parcels. Location of land lots differed by owned ethnic communities table 6.

Table 6: Land ownership and land lots by ethnic group (2016)

Ethnic	HouseholdS	ownershipS	No-LotS	% of land lots
Burmese	117	117	94	49.47
Chinese and its relative ethnic	53	53	78	41.05
National ethnic	8	8	10	5
Other ethnic	9	9	8	4
Total	187	187	190	100

Source: Field survey

**4.2 General Land Use Pattern of Study Area**

The general land uses of study area are residential land use, commercial land use, industrial land use, public and government land use and transportation land use. Figure (5)

**4.2.1 Residential Land Use**

Residential land use means which has a dwelling erected to set up to build upon it for human habitation. In this study area, the residential land use was divided into single family use, multifamily use, and mixed use.

**Single family use:** A single building containing a single residential dwelling unit that have been converted to multiple occupancy units are considered to be multifamily residential. The single family residential area is more founded along the inner study area such Thuzartar street, Thuseiktar Street, Thunandar Street and Thumarlar Street.

**Multifamily use:** Any building or group of buildings or containing two or more individual dwelling unit. Family structure converted to multiple dwelling units. In the study area, the multiple family units are found rarely.

**Mixed use:** A combination of any two or more land uses at a single location, the most typical example that was encountered includes a commercial use on first floor and residential use on the floor above. However, many different land use combinations exist throughout the study area especially at the outer portion of study area.

**4.2.2 Commercial Land Use**

The term commercial land use refers to those lands which are used for commerce. There were occurred commercial retail and commercial wholesale in the study area.

*Commercial retail:* A retail establishment offering clothes, Shoes and slippers shops steel and aluminum, tea shop supplies groceries vehicles sales company, electric material shop and some hard ware shop.

*Commercial wholesale:* These land use are found along the 62 road, some of phone shop, hard ware materials and furniture shop. Some are found on the Ngu Shwe War road.

**4.2.3 Land Use for Services**

In the study area, some of services are not separately. They are including under commercial land use as family activities with residential land use.

**4.2.4 Industrial Land Use**

Industrial land use is not separately to other land use in the study area. There are three industries, which are textile and mill, slipper production enterprise, and small food enterprise. The ownerships are ethnic Chinese groups and Burmese groups.

**4.2.5. Land Use for Public and Government Department**

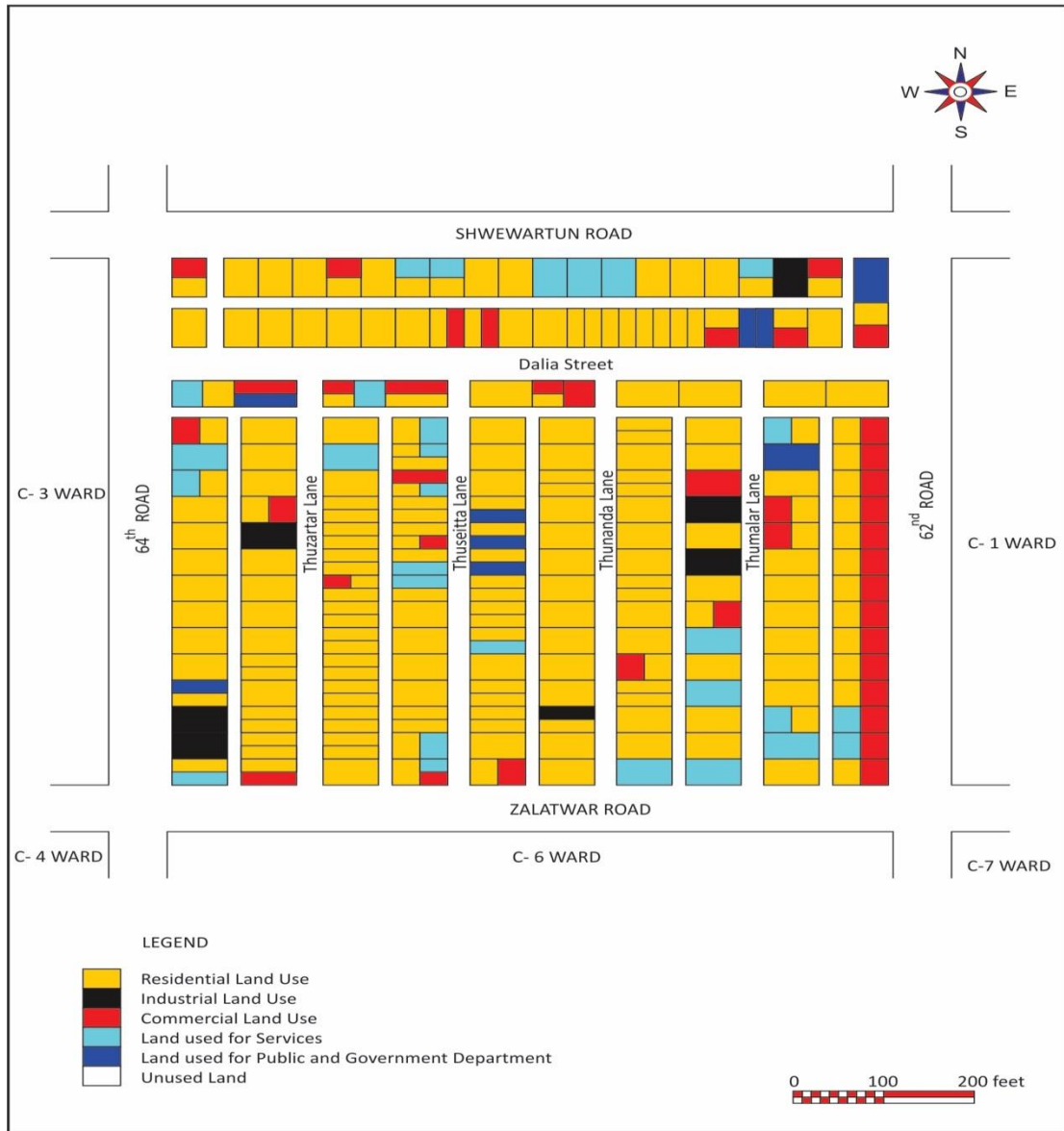
The term institutional land use refers to those lands which are used for governmental and organization. In the study area, there are two religious building one is Dharma hall for Buddhist religions and another one is for Chinese Christian religions. The social welfare organizing is use for NGO that building renter from Chinese group.

Table 7: Urban Land use Pattern: Summary

Ethnic	total parcel (40*60) ft	%	Chinese and Its relative ethnic group	%	Burmese and its relative ethnic group	%	National ethnic group	%	other ethnic	%
residential	124	65	44	56	72	76.6	7	70	5	62.5
Commercial	37	19	29	37	10	11	2	20	0	0
Services	24	13	3	4	10	10.6	1	10	3	37.5
G&P use	5	3	2	3	2	2	0	0	0	0
Total	190	100	78	100	94	100.0	10	100	8	100

Source: Field survey

URBAN LAND USE PATTERN OF BLOCK C-2, MYOTHIT WARD-3 IN CHANMYATHAZI TOWNSHIP(2016)



Source: Based on Field Survey Data.

Figure 8: General land use pattern of Study Area 2015

#### 4.2.6 Housing Types

Housing is being an important in physical character of study area. It shows the wealth of households. In the study area, the types of housing are not only found as two stories, three stories, and four stories but also bamboo housing. Most of higher buildings are possessed by the ethnic Chinese group rather than the ethnic Burmese group was occurred in the study area. Most of settlements are complexes with 84 brick wall and concrete roof houses 54 houses with wooden and zinc roof and timber with concrete and bamboo with zinc roof housing types are 51 houses with respective ethnic groups. The greater well building was occurred as possess of Chinese group in the year 2016. In years 1990s, the study area was land lots with shack, some of houses are two stories with bamboo and roof of zinc. After 2010, the study area was distinctly changed to the concrete building like as two stories, three stories and four stories. As the percentage, the four stories types of building 73% was

owned by Chinese Communities.18% was owned by Burmese communities. In the one stories types, the Burmese Communities was owned the 75% of one stories housing types Table (8).

Table 8: Change of Housing types (1999-2016)

Types	1999	2016
	Housing	Housing
Concrete	7	97
Brick and wood	58	58
Bamboo	33	45
Unused lot	92	0
Total	190	190

Source: MCDC and Field survey

Table 9: Levels of building with ethnics, 2016

Ethnic	levels of building				total building
	one stories	two stories	three stories	four stories	
Burmese	(34%)	(52%)	(12%)	(2%)	117
Chinese/its relative ethnic	(11%)	(47%)	(26%)	(15%)	53
National Ethnic	(31%)	(54%)	(15%)	(0%)	13
Others	(43%)	(57%)	0	0	7

Source: Field survey

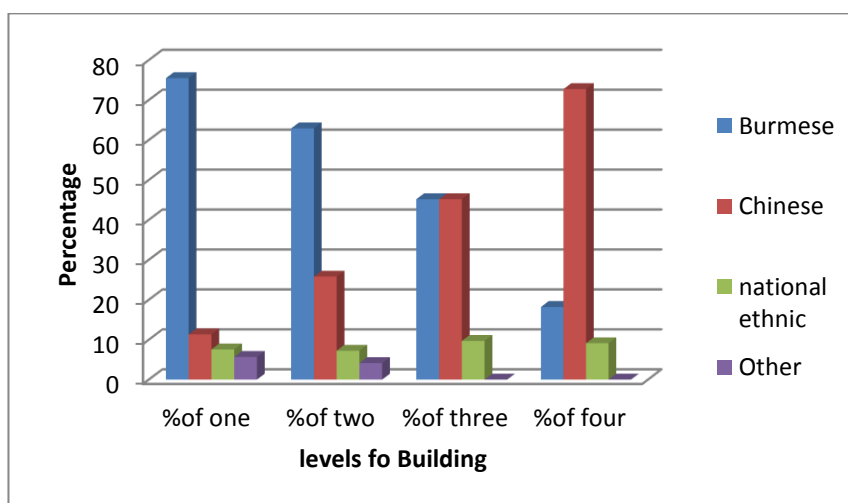


Figure 9: Percentage of types of building with ethnic groups

Table 10: Housing Types in Study Area (2016)

Ethnic	Type of house		
	Concrete	Brick -Wood	Bamboo
Burmese and its relative ethnic	28	44	45
Chinese and its relative ethnic	45	8	0
National Ethnic	5	2	2
Others	3	0	4

Source: Field survey



Plate 1: Built Up area in the Study Area up to 1999.

Source: Google Image, 1999



*Plate 2: Built Up Area of the Study Site, 2016*

*Source: Google Image, 2016*

## **6. Conclusion**

The study area is an extension area that residences are fire victim. The origin of farm land was changed to the residential land use according to the government urban development policy. Moreover, government market opening policy, Mandalay City was more prominent as a trade center and was produced to migration process from rural to urban and frontier to inland. As a results, the varieties of ethnic occurred in the study area as Burmese, Chinese, Kokang Chinese, Monewun Chinese, Shan Kachin, Chin and others. After 1999, the study area was changed to the land use pattern and infrastructures by ethnics. The Chinese and its relative ethnic groups are more influenced to the land space than the Burmese groups in the study area. They occupied on the main roads mostly. Most of concrete buildings are possessed by Chinese groups. So, the study area was changed to the urban land use from the pure residential land use into mix residential land use pattern with economic activities. The sizes of land lots were changed in order to land ownerships that indicating the land ownerships status. Above those factors may reflect to the urban land use pattern of Chanmyathazi Township, Mandalay City.

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