Integration of Traditional Architectural Identities with Contemporary Myanmar Houses in Central Myanmar

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Integration of Traditional Architectural Identities with Contemporary Myanmar Houses in Central Myanmar

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ABSTRACT

Many architects around the world are trying to integrate their architectural identity and past symbolism with new building materials and techniques to the design of contemporary buildings. To design a house in Myanmar traditional style, one essential thing to be reached is what the essence of a Myanmar traditional house is. It is vital to consider proper ways to integrate the architectural identities and past symbolism with new building materials and techniques to the design of Myanmar contemporary buildings.

The aim of this research is to integrate the essence of Myanmar traditional architecture with design of contemporary houses. This is an attempt to encourage the practice of integrating the traditional characters in future Myanmar buildings, which might have endangered by foreign intruded characters.

Firstly, there is a literature review of Myanmar traditional houses from architectural aspects and background influences. And then, a field survey of contemporary Myanmar houses and interviews with house owners in central Myanmar are carried out to know how they have been developed under the influences of local climate, culture, mode of living and custom beliefs of their particular times and places. Investigated houses are selected from particular suburban and urban areas in central Myanmar.

From the aforementioned studies, an evaluation of how spaces are divided, articulated and manipulated by socio-cultural values and functional requirements of the inhabitants is made to find out the specific architectural character over the confined research area. Case studies are carried out upon reflections of traditional characters in present day residential architecture. There is an analysis of every element of the design composition to assess which composition gives what kind of traditional sense to what extent. Architectural identities of traditional Myanmar houses are taken into consideration to integrate them with contemporary houses.

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CHAPTER 1
INTRODUCTION

1.1. Introduction

Everybody has learnt from early childhood to associate certain forms and shapes with certain types of building. To many millions of people throughout the world, the pointed Gothic arch is associated with religious buildings. Tall circular towers are associated with mosques, and so on. The particular kind of association varies from country to country and society to society. At one time in the immediate past, heavy elaborate classical-type buildings were associated with authority and money, and banks and government buildings were not considered impressive enough if they were not designed in this style. So everybody has within himself a preconceived idea of what a house or a church should look like when he comes to experience a particular house or church [Miles Danby, 1963]. Therefore, the finished building must suggest the idea of residence or religion in a way that can be readily understood by ordinary people. To achieve this, the architect must understand something of the symbols currently associated with the ideas in the particular society in which the building will be located.

Many architects around the world are trying to integrate their architectural identity and past symbolism with new building materials and techniques to the design of contemporary buildings. Integrating the traditional values to restore identity and harmony with the surrounding environment is a trend into better future.

The people of Myanmar have been living intimately in traditional Myanmar houses which own their significant architectural characters. Since recent decades, architectural styles with foreign characters have obviously intruded into the building industry of Myanmar. In response to this inevitable nature of globalization era, it is in need of conserving the traditional and cultural identities of Myanmar architecture. It is vital to consider proper ways to integrate the architectural identities and past symbolism with new building materials and techniques to the design of Myanmar contemporary buildings. In order to do so, one must have some concepts of the essence of Myanmar traditional architecture.

To design a house in Myanmar traditional style, one essential thing to be reached is what the essence of a Myanmar traditional house is. Some people think they have captured the spirit of traditional architecture by adding some decorative elements to the house. They should endeavour to manage the basic element of architecture that is 'the space' in relation to the spiritual beliefs and way of living of Myanmar. Here, the individual architectural elements of a traditional house such as space defining and space enhancing elements come into play. There also are climatic, socio-economic, cultural, cosmological and religious factors influencing the design of a traditional house to be taken into account in order to be a reasonable and sensible approach.

1.2. Background

Having observed the Myanmar contemporary architecture, it is in a transitional state to adapt with the advanced construction technologies. It is supposed to be a change in contemporary trend to modern architecture.

Meanwhile, building designs from foreign countries have obviously intruded into the building industry of Myanmar since recent decades. This phenomenon became a threat to cultural and architectural traditions of Myanmar especially in the case of contemporary houses.

Many countries in the world have rediscovered their own traditional architectural identities and integrated them in designs of contemporary buildings. These instances can obviously be seen in the countries like Japan.

If an architect is assigned to design a house in Myanmar traditional style integrated into modern technologies and materials, the followings are essential to be considered.

- What are traditional Myanmar houses?
- How do they reflect Myanmar culture and society?
- What is the essence of a Myanmar house?
- Is this essence still integrated into contemporary houses?
- Which architectural element or composition gives a sense of identity?
- How can it be integrated into design of a contemporary Myanmar house?

It needs to find out the optimum means to create an architectural product impregnated with the essence of Myanmar traditional architecture, spiritually as well as physically.

The integration of traditional architectural identities in new residential buildings in order to manifest the national and cultural identity is the ultimate responsibility of all the architects and local authorities.

1.3. Research Objectives

The aim of this research is to integrate the essence of Myanmar traditional architecture with the design of contemporary houses. To encourage the practice of integrating the traditional characters in future Myanmar buildings, which might have endangered by foreign intruded characters, is one of the objectives of the research.

The literature review of the influencing factors on traditional houses is made for the understanding of spatial relationships that determine domestic space. Architectural identities of traditional Myanmar houses in central Myanmar are evaluated based on the previous research. Spatial composition in contemporary houses is analysed and compared with that of the traditional houses to know the changes and similarities. There is a case study of a contemporary Myanmar house in Yangon which was designed to integrate the essence of traditional architecture. The analysis is mainly focused on the spatial composition of the whole house to find out which composition of space reflects what kind of space experience or concept. Finally, there are recommendations for the integration of the traditional concepts with design of contemporary houses. This research can be referred as a provision for students of architecture and architects who are willing to create a built environment harmonized with the unique culture and society of Myanmar.

1.4. Scope of the Research

The term “Myanmar” in the title of this thesis represents the Burmese (*Bamar*), the dominant ethnic group of the Republic of the Union of Myanmar. “Contemporary Myanmar Houses” refers to the houses existing or completed at present day.

1.4.1. Research Area

Changes and advances in building materials, construction techniques, and mode of living and traditional house style are less common in rural areas than in urban settings. People in rural areas normally live in their traditional style houses, working traditional livelihood activities. If compared to urban areas, houses in suburbs are more of a family style detached houses rather than multi-storeyed apartment flats.

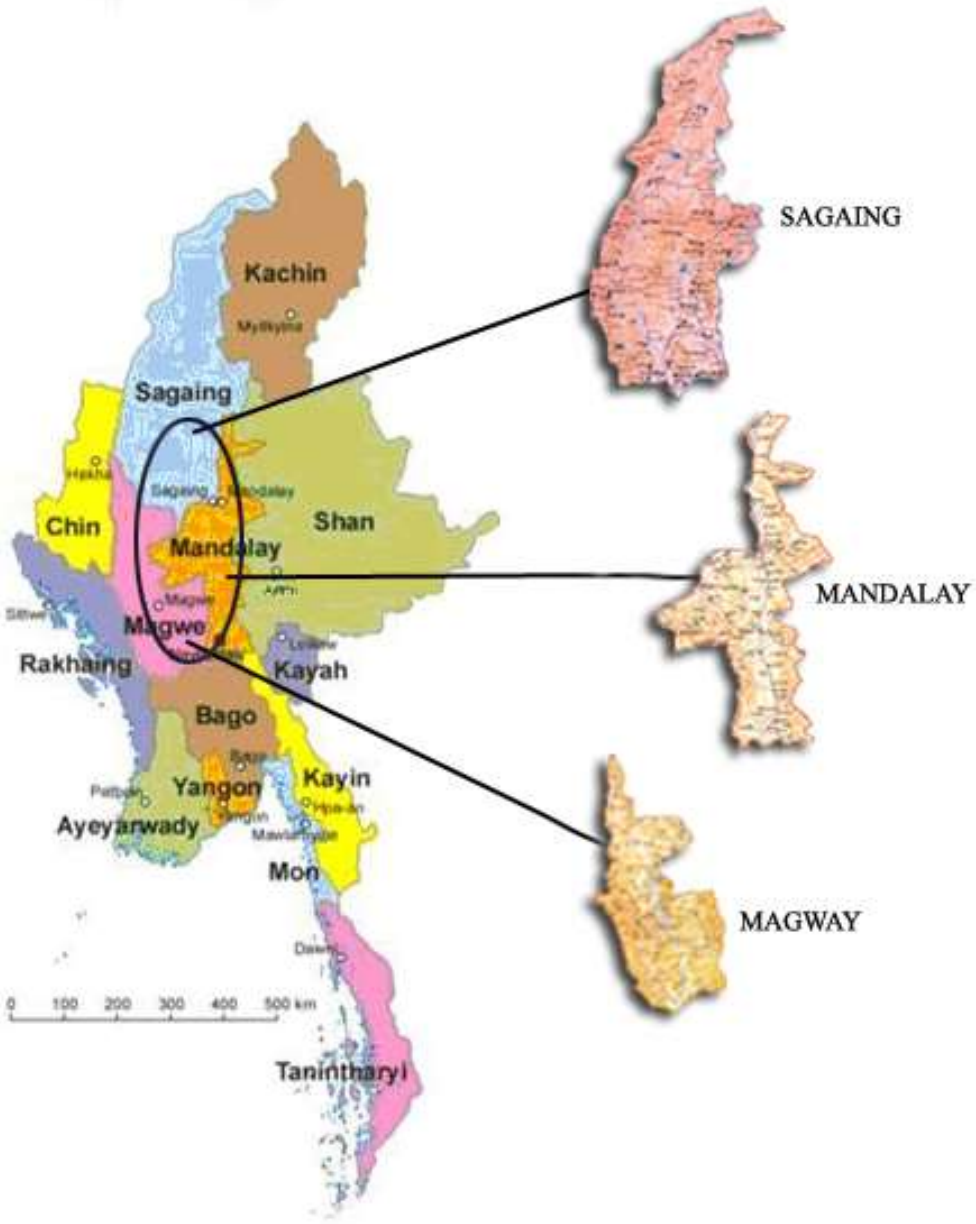

Figure 1.1. The Myanmar Map Showing the Territories of 3 Research Regions in Central Myanmar [Source: commons.wikimedia.org]

To reduce the scope of the empirical investigation size, field survey is confined to the central Myanmar. It encompasses the central part of Myanmar which includes most of the plains of Mandalay Region, the lowland areas of Magway and Sagaing Regions. Highland areas of these three regions are not included in the study because house styles are different from those of the plains areas according to the difference in geographic and climatic conditions.

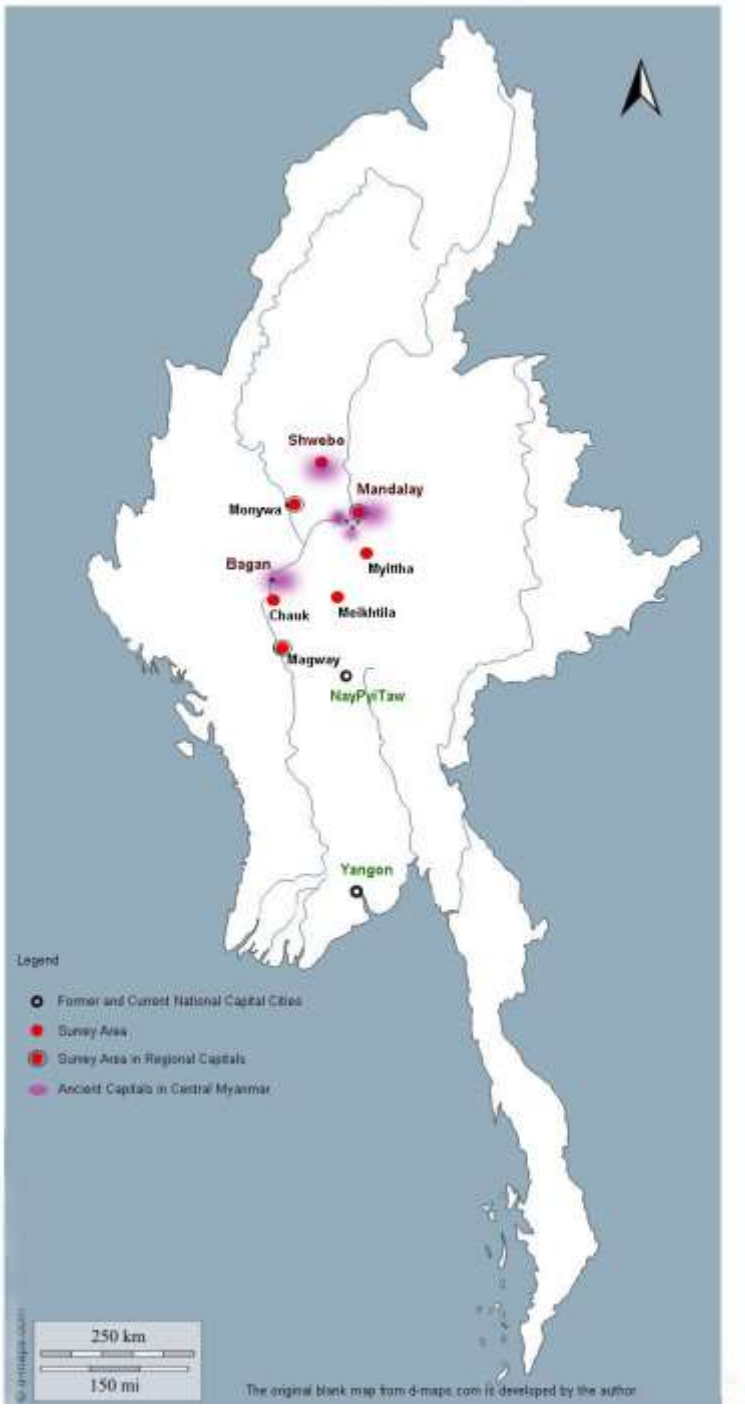

Figure 1.2. The Myanmar Map Showing the 7 Research Areas and Ancient Capitals in Central Myanmar [Source: http://d-maps.com/carte.php?num_car=35247&lang=en]

One reason for choosing the central Myanmar is that, it still maintains its own culture, custom belief and feature of houses inherited from past traditions. Another reason is that it has been a highly civilized region of ancestors in history of Myanmar.

The first Empire of Myanmar, Bagan Dynasty (849–1287) was established in Bagan in central Myanmar. Besides, it was the place where the reign of the Kone Baung Dynasty of Myanmar started in 1752 and ended in 1885. [New World Encyclopedia: (2014)].

During the Kone Baung Dynasty, the last Dynasty of Burmese Monarchy, capitals were shifted for religious, political and strategic reasons. According to New World Encyclopedia, these capitals were:

- Shwebo (1752-1760)
- Sagaing (1760-1764)
- Ava (Innwa) (1764-1783, 1823-1841)
- Amarapura (1783-1823, 1841-1860)
- Mandalay (1860-1885)

The majority of Myanmar (Bamar) people have been living primarily in this region through the history. It is believed that cultural identity, art and architecture of Myanmar were deeply rooted and developed in central Myanmar for over centuries in the history.

1.4.2. Selection of Sample Houses

When the field survey of present trend of Myanmar houses in aforementioned areas is carried out, selection of sample houses will be made upon common people's dwellings in suburbs and urban areas.

In selection of houses for the survey of contemporary houses, detached houses most of which were built on their own lots or yards with or without fences were preferably chosen. Houses which were constructed from around the year 2000 to the time of survey were confined for the survey so as to get the most recent data of the present-day houses. The survey was carried out from December 2015 to February 2016.

Houses of common people whose income level is neither too low nor too high were targeted to conduct the survey. The house should be one where people are actually residing at the time of survey or where people lived at least once after it had been completed in order to know the actual living style. Those houses which local residents introduced to get in and those houses in which we were allowed to conduct the survey are including in the list.

Majority of the sample houses are from suburban areas while some are from urban areas. There are a total of two hundreds and ninety-eight (298) houses studied in the confined areas for the research purposes.

1.5. Research Content and Methodology

This includes a review on architectural characters of traditional houses from Myanmar. Influencing factors on the design of traditional houses in central Myanmar are discussed in Chapter (2). Geographical condition and climate of central Myanmar is introduced first. Population distribution by race and religion in the research areas are considered as one of the influencing factors. There is a discussion on how indigenous building materials affect the structural system and measurement in traditional houses. Traditional beliefs, customs, and practices in building a traditional Myanmar house are included in the literature review which is the key to the understanding of spatial relationships that determine domestic space.

Architectural identities of traditional Myanmar houses in central Myanmar are introduced according to the previous research work and a field survey (2009 to 2011) which was carried out in approximately 150 traditional houses of 12 towns and villages in central Myanmar. To the whole extent of the confined research area, four distinct house forms and facade compositions are identified. These house forms have their own significance; some have regional identity whereas some have attained common people's preference for decades. There is an evaluation of architectural identities of Myanmar houses in central Myanmar in the last part of chapter (3).

A field survey and interviews with house owners of contemporary Myanmar houses in the research area is conducted to know how they have been developed under the influences of local climate, culture, mode of living and custom beliefs of their particular times and places. Chapter (4) is comprised of two main parts of discussion. The first part is about the characteristics of field survey. The latter is comprehensive discussion of the findings from the field survey. Spatial composition of functional spaces in contemporary houses in the survey areas is analysed from architectural aspects such as spatial, structural, functional, material and architectural compositions. Seven different types of multifunctional space recorded in the survey are classified and illustrated with sample house plans. After that, the most common spatial composition is studied from each research area taking the construction cost of each house as a basis reference for selection.

In Chapter (5), characteristics of contemporary houses analysed from the field survey during (2015-2016) are compared with those of traditional houses in the same research area. These are based on cosmological, climatic, functional, socio-cultural aspects and lifestyle of the inhabitants in the respective studied region and time period. There are evaluation and remarks on the comparison of spatial compositions and life style along with the transition of time.

In the first part of Chapter (6), case study of a contemporary Myanmar house in Yangon was carried out upon reflections of traditional characters in it. The analysis is mainly focused on the spatial composition of the whole house to find out which composition of space reflects what kind of space experience or concept. The study was carried out with the aid of architectural drawings provided by the architects, a site visit and verbal interview with the architects as well.

After evaluating the contemporary style and requirements of Myanmar houses, architectural identities in spatial concepts which are possible to integrate with contemporary houses are recommended. The recommendations would be basic planning ideas for a Myanmar house including concepts of individual functional spaces such as living area, bed room, shrine area, dinning and kitchen spaces.

The theoretical data and empirical results from field survey are divided into various architectural components such as horizontal space composition and vertical space composition. Throughout the research, architectural identities and spatial concepts of traditional Myanmar houses are taken into consideration to integrate them with contemporary houses.

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CHAPTER 2
INFLUENCING FACTORS ON MYANMAR TRADITIONAL HOUSES IN CENTRAL MYANMAR

2.1. Introduction

Every building is affected by its environment. The climate of the locality and the buildings around it mould the building, and therefore, even though social, cultural and economic aspects are important, it owes much of its shape to these factors. Climate, in particular, produces certain easily observed effects on architectural designs. In designing and planning, the configuration of buildings, their orientations, and their arrangement in space create a specific microclimate for each site. To this, the building materials, surface textures and colours of exposed surfaces of the building, and the design of open spaces, such as courtyards, gardens and squares are added. These man-made elements interact with the natural microclimate to determine the factors affecting the comfort in the built environment: light, heat, wind and humidity.

In this chapter, geographical condition and climate of central Myanmar is introduced first. Building orientation and plan composition are largely influenced by the hot and dry nature of the climate. Section (2.3) shows the facts about population distribution by race and religion in the research areas which is one of the most important factors to be considered in spatial composition of a house. Section (2.4) has some data collected on indigenous building materials and construction technology which are locally available in central Myanmar. There is a discussion on how indigenous building materials affect the structural system and measurement in traditional houses. The materials surrounding the occupants of a building are of prime importance for protection against heat and cold. Great care must be taken in the choice of the wall and roof materials and their thickness with respect to their physical properties, such as thermal conductivity and transmission and optical reflectivity. Depending on the choice of materials, there is a spatial determination in planning and construction.

Another strong influential factor is discussed in Section (2.5) under the heading: traditional beliefs and customs of Myanmar people. This is later sub-divided into four

more comprehensive issues of discussion as religious beliefs and rituals, social and cultural behaviour, cosmological ideas, traditional habitation and kinship. Traditional beliefs and customs related to the religion, culture, society, kinship and cosmology have considerable influences on the Myanmar traditional houses.

Section (2.6) introduces some of the many beliefs and practices in building a traditional Myanmar house. This includes s few remarkable written rules and practices described in traditional builder's handbook as well as some other beliefs which the reference books did not mention. Though some of them are deemed to be superstitions, many of Myanmar carpenters and house owners are still practising when they build houses. Section (2.7) concludes the literature review of the influencing factors on traditional houses which is the key to the understanding of spatial relationships that determine domestic space.

2.2. Geographical Condition and Climate

Myanmar has an area of 261,789 square miles (678034 square kilometers). It lies between the latitudes 9˚ 32′ N and 28˚ 31′ N, and between the longitudes 92˚ 10′ E and 101˚ 11′ E. Borders are shared with Bangladesh and India in the northwest, China in the northeast, and Laos and Thailand in the southeast. Towards the south and southwest are the Andaman Sea and the Bay of Bengal. The territory of Myanmar can be divided into distinct zones, namely the northern mountain ranges, the Shann plateau in the east, the central dry zone, the Ayeyarwaddy delta areas and the long Tanintharyi strip in the south. Most of the population and agricultural lands are found along the Ayeyarwaddy, which is navigable for about one thousand miles. The western, northern, and eastern regions have mountains and high valleys and plateaus. The western region has the Rakhine, Chin, and Sagaing hills. [Aung-Thwin,M.A.,1999]

The central plain of Myanmar on the bank of the Ayeyarwaddy River between Shan and Rakhine mountain chains is geographically defined as the central core of Myanmar. The Ayeyarwaddy is the most important river of the region and along it were sited the great cities of ancient civilizations. This encompasses Mandalay Region, Magway Region and southern part of Sagaing Region.

Myanmar normally experiences three seasons: the dry season from March to June, the wet season or monsoon from July to October, and the cold season from November to February. Climate varies from region to region due to the diverse geography

of central Myanmar. Normally, being situated in hot dry zone, in the hottest period, average maximum temperature in central Myanmar is about 34˚C and in the coldest period average minimum temperature is about 20˚C according to the 2007 climatologic data of the Department of Meteorology and Hydrology. Average maximum total precipitation is 915.0 mm per a year. The region is in the direction of monsoon wind. Mean relative humidity is 70 percent.

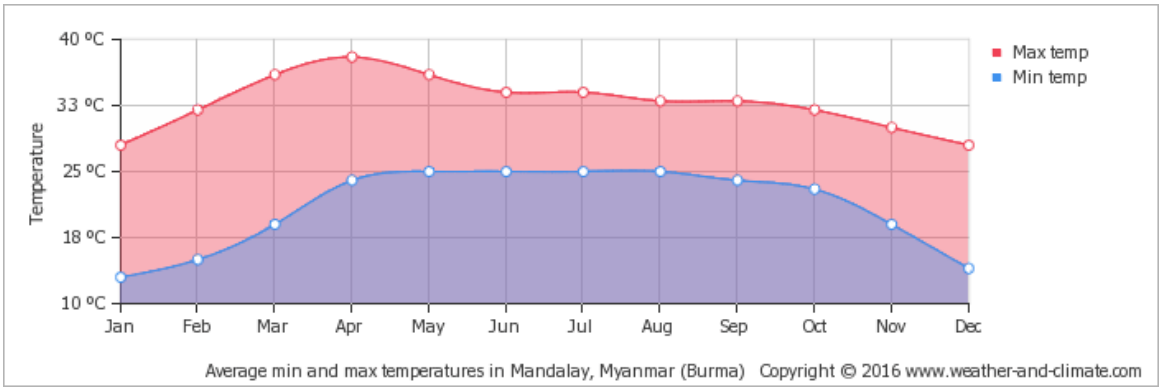

Figure 2.1. Average Minimum and Maximum Temperature in Mandalay over the Year 2016 [www.weather-and-climate.com]

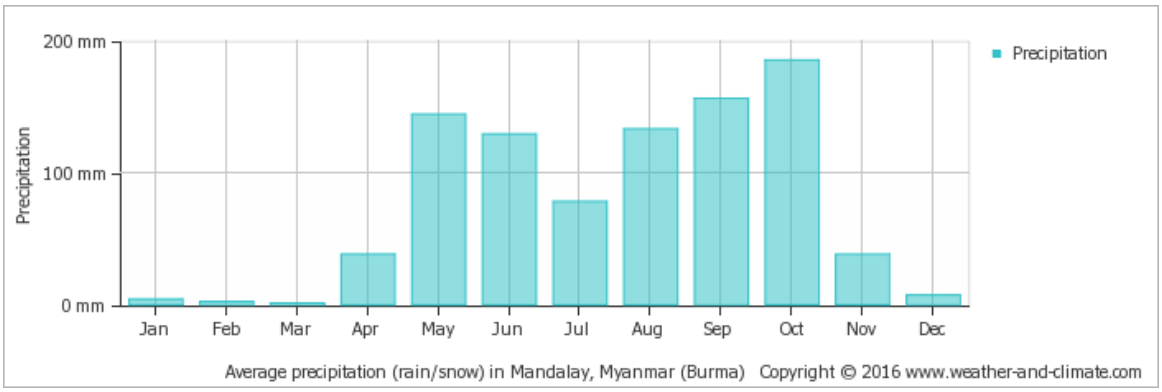

Figure 2.2. Average Monthly Precipitation in Mandalay over the Year 2016 (Rainfall, Snow) [www.weather-and-climate.com]

To properly balance human needs with environmental opportunities and liabilities, detailed analysis of the specific site is required. How facilities relate to their context should be obvious so as to provide environmental education for its users. The basic considerations are orientation and shading.

In hot climate zone like central Myanmar, the sun is the major source of heat. To consider any site plan, the position of the sun must be determined for all hours of the day at all seasons as well as the direction of the prevailing winds, especially during the hot

season. In addition, for an ensemble of buildings forming a sector, there will be reflection from adjacent buildings and wind screening by clusters of buildings, which contribute to a specific microclimate for each location in the sector.

Wind movement and humidity are also important and should be considered simultaneously with the direct and indirect effects of the sun. The optimum orientation of the building block with regard to sun factor is east-west. In this case, the north façade is exposed to the sun's rays at the winter solstice from sunrise in this region. Although the optimal orientation for single buildings is with the long side aligned from east to west, for many reasons this cannot always be applied so simply over the entire plan of a city or sector. Some single buildings must be squares that may be orientated at any angle from the north, with each case requiring an appropriate means of shading, depending on its orientation.

Generally, a building with a façade opening to the west is the worst case encountered, owing to the heat gain of the surrounding environment during the day and the angle of altitude, which allows the sun's rays to penetrate into the interior. However, for a sector with the long façade facing west and east, blocks of buildings can themselves shade another if they are located close enough with each other. [Miles, 1963]

To respond the hot and dry feature of the climate, cool air is favoured and space organization in the house is with minimum partitions, allowing maximum flow of cross-ventilation. The house is normally raised on stilts and openness under the house reflects the attempts to get good ventilation in the design. To control direct solar radiation and glare from the bright sky and surroundings, balcony areas and deep overhang of roof are integrated into the organization.

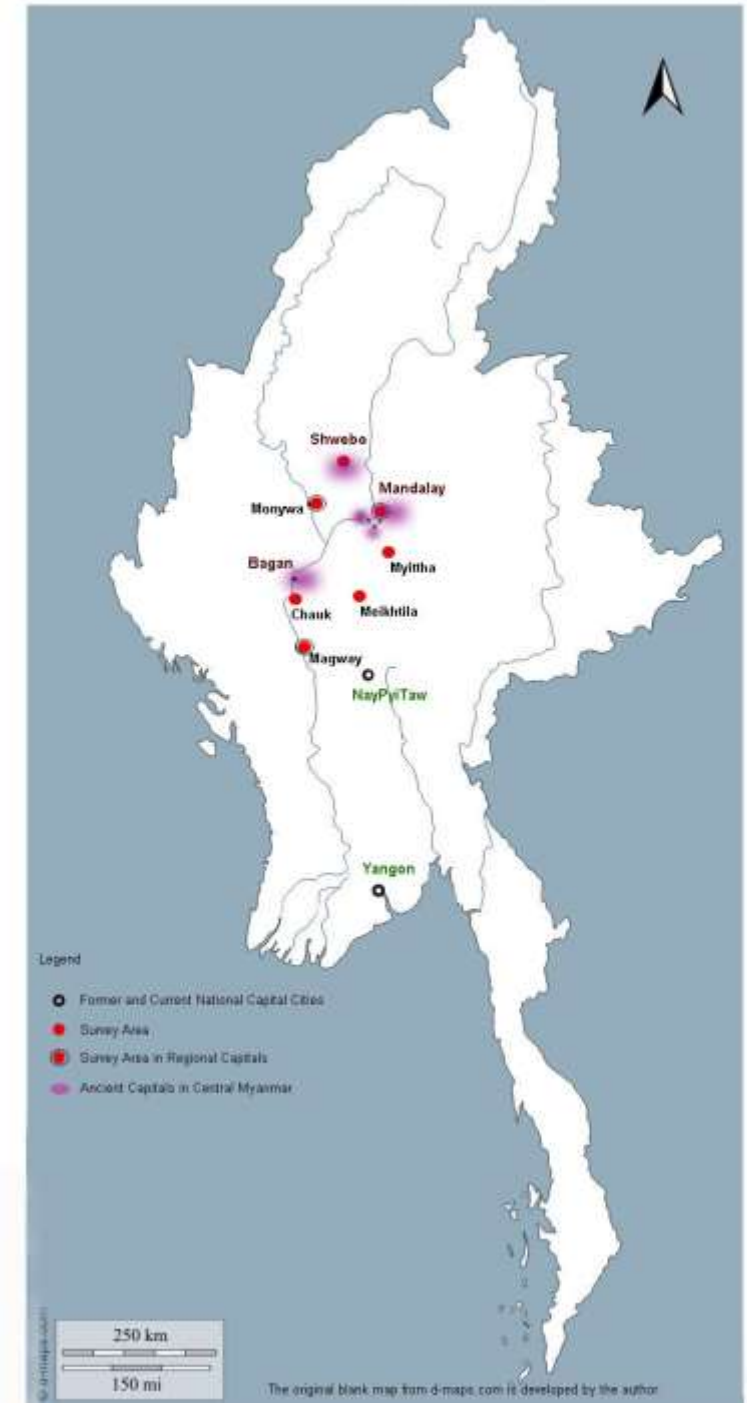

Figure 2.3. Location of 7 Research Areas in Central Myanmar

[Source: http://d-maps.com/carte.php?num_car=35247&lang=en]

2.3. Population Distribution by Race and Religion

The Myanmar (Bamar) ethnic group lives primarily in the central lowlands, while the other ethnic groups live mainly in the highlands. According to the demographic announcement of the Department of Population, the estimated population figure of

Myanmar in 2014 was over 51 million. There, the number of Myanmar people accounts for about 70 percent of the population.

Among the seven states and eight regions, the population is the highest in the following seven regions. They are:

- Sagaing Region,
- Magway Region,
- Mandalay Region,
- Bago Region,
- Yangon Region,
- Ayeyarwaddy Region,
- Tanintharyi Region.

According to the population census data for 2014 by Department of Population, Ministry of Immigration and Population (2015), the population distribution of the Myanmar (Bamar) ethnic group is the largest in three main regions which are Sagaing Region, Magway Region and Mandalay Region.

2.4. Indigenous Building Materials and Construction Technology

Locally available building materials in central Myanmar are brick, timber, bamboo, thatch and palm fronds. Cement, steel, glass and other advanced construction materials are also available through transportation systems. As it is generally economical to use local materials, the traditional Myanmar house is made largely of timber. Flattened pieces of bamboo made into large plaited sections are used to make the walls. The floors are mostly made of wooden planks and some are of bamboo stripes. The frame of the house is made of bamboo, palm trunk and wood. Teak is used for structural and other purposes in houses of the rich. These structural materials are used in their natural condition without any seasoning. Roof coverings are made of a variety of materials such as clay tiles, wood shingles, and thatch from broad-leafed grass and largely of palm fronds, bamboo slats and corrugated iron sheets.

Table 2.1. Types of Building Materials by Conventional Household

No.	District/ Township	Total Household	Apartment	Brick House	Semi-pucca	Wooden	Bamboo	Hut (2-3)yrs	Hut 1 yr	Other
1	Mandalay	324,477	18,845	42,728	32,420	71,166	148,962	4,288	3,694	2,419
2	Meikhtila	68,439	3,823	6,865	6,221	16,344	34,260	518	276	132
3	Myittha	46,017	496	2,394	1,959	4,916	35,767	351	55	79

4	Chauk	44,618	626	2,756	2,576	10,608	26,366	865	429	392
5	Magway	68,677	2,604	6,129	3,407	18,595	36,067	1,124	515	236
6	Monywa	75,962	2,619	7,044	6,413	20,977	38,038	532	168	171
7	Shwebo	50,247	689	4,181	2,621	19,561	21,811	562	107	715
	Total [No.]	678,437	29,702	72,097	55,617	162,167	341,271	8,240	5,199	4,144
	Total [%]		**4.4%**	**10.6%**	**8.2%**	**23.9%**	**50.3%**	**1.2%**	**0.8%**	**0.6%**

Source: Myanmar Population and Housing Census Report, 2014

Post and beam framing system is the usual method of construction in this region. There have been traditional structural principles and dimensions of the individual components formulated by the ancestors. These are still practised by traditional house builders in some regions. Length of span and size of interior spaces are limited by structural frame. Therefore, the usual spacing between two posts is about 8 feet. This small span length is just fit for small houses but if larger interior spaces are required, there become many posts in the plan.

A basic spatial determination begins with the number of posts (*Pin* in Myanmar) along each side and the modular arrangement of them. Based on the span between the two posts, *Pin* became a construction standard for traditional buildings.

It is a traditional practise to use post and span in the form of a modular unit. It is somewhat a simple type of modular system as the span is generally kept about eight to ten feet which is quite reasonable and sound. If a longer span is used, the strength will considerably decrease. If the span is very short relative to the size of the posts, it will not be economical as greater number of posts will have to be used. Therefore, this system can be regarded as a safe, sound modular system for timber houses.

A post in the traditional concept is regarded as a tree and the word *Pin* which is meaning a tree represents a post. Each span represents a room which is called as *Khann* in Myanmar. So, the words *Lay Pin, Thone Khann* means four posts with three spans and people can easily understand that the frontage of the house will measure about twenty four to thirty feet. Likewise, if it is a house with five posts and four spans, each side of the house will measure about thirty two to forty feet.

If it is mentioned only with the number of posts without mentioning the number of spans, for example, *Lay Pin, Thone Pin,* it means that there are three spans in the frontage and two spans in the side of the house. From this basis, the area of the house can be calculated without any difficulty.

Figure 2.4. Four Timber Posts on Each Side (*Lay Pin, Thone Khann*) of a Traditional Stilt House in a Flood Plain, Mandalay Region [Field Survey, 2010]

The designer of a traditional building first determines how many posts (*Pin*) will be used in construction when the first consideration of plan begins. There have been traditional structural systems and dimensions of the individual members formulated according to this concept. The *Pin* allows the designer to build with an understanding of not only how much material is needed but also how each structural component will be placed together. In this way, traditional architecture has employed a unit of standardisation in planning and construction of residential buildings.

In early traditional houses, joints between the structural members are applied without the use of metal connectors. Later, timber and metal splice connections are used with bolts, nuts and other timber connectors. [Khaing, 2002]

2.5. Traditional Beliefs and Customs of Myanmar People

Traditional beliefs and customs related to the religion, culture, society, kinship and cosmology have considerable influences on the Myanmar traditional houses. Though some of them are deemed to be superstitions, traditional Myanmar people are still practising when they build their houses.

2.5.1. Religious Beliefs and Rituals

The majority of the people in central Myanmar are Theravada Buddhists. It has frequently been said that being Myanmar (Burmese) is synonymous with being Buddhist. There are two main streams of Buddhism school: *Mahayana* and *Theravada*. The

Myanmar people show a preference for Theravada Buddhism. Myanmar is also well known for its important centre of learning for scripture and meditation within this tradition. Theravada Buddhists believe in the law of Karma (action) which simply states that good deed begets good and evil deed begets evil in terms of reaction. There is a widely used saying in the Buddhist society: “what we reap is what we have sown “, which is one of the teachings of Gautama Buddha.

Figure 2.5. Buddha Image on the Uppermost Level in the Multifunctional Space
[Field Survey, 2015-2016]

The Buddhist Myanmar people always place the statue of Buddha on an altar or an elevated shelf in a room called shrine in the head part of the house. When they make praying or worshiping to the Buddha, they always face towards those directions in front of the Buddha statue or image. As religious rituals, they often hold donations and group offering ceremonies to the Buddha occasionally. Consequently, a space relatively wide enough for that purpose is essentially needed there.

One significant tradition is that they sleep with their heads always pointing towards east or south where the shrine is located. They never sleep and lay with their feet pointing towards these directions, since it is spiritually considered as disrespectful manner to the religion.

2.5.2. Social and Cultural Behaviour

Leisure and entertainment for the people mainly consists of ceremonies for monk hood, seasonal and pagoda festivals. Most of these activities take place during the cool,

dry seasons, before or after the rainy agricultural season. Generally, the life of the villagers has been the same for centuries.

Family ties are strong and families tend to be extended for generations. A newly married couple may live with the parents of one partner but soon establish their own household. It is not amazing to find grandparents, uncles, aunts and cousins altogether living under the same roof. There is minimal privacy within the family. Each member of the family is expected to contribute in some way towards either the expenses or the running of the household.

In the family, the husband is basically the head of the household and most respected, but the wife also has considerable authority in the domestic aspects. The mother is usually the closet to the children, together with the aunts. Most approaches to the father will be channelled through the mother, although for important or difficult issues, the mother will often defer decisions to the father. While the father rarely gets involved in bringing up children or domestic problems, he will take leading in leisure activities for the family, which usually consists of going to pagodas, monasteries and entertainments. The day to day running of the household, including expenses, is done by the mother and any other relatives staying in the same home. The whole income is handed over by the father to the mother who will divide the sum according to various expenses. These often include giving parents-in-law a monthly supports, making charity donations to important causes and handling children's expenses.

Relatives who come to visit, even for a long time, are welcomed. Indeed, they are expected to stay with the family. However, in return for this hospitality, they are expected to help whatever they can. They may show their gratitude by looking after the children, teaching them, helping with preparing meals or going along with the mother when she shops.

In urban areas, there are now many smaller nuclear families consisting of the parents, child and maid. Managing such a family may seem easier, with fewer family members and certainly there may be more privacy. But, in fact, such an arrangement often leads to a lower quality of life for all concerns as working parents have to struggle without the help, advice, care and contributions of the extended family.

Than Htay Oo: (2007) discussed the levels of privacy in her Ph.D. dissertation "Modern Trend in Family Houses within the Context of Traditional Habitation Concepts in Central Myanmar ". " Several levels of privacy are noticed in traditional communities.

The first level is the privacy of the community itself which provided protection and prescribed acceptable social behaviours for each individual. The second level of privacy is provided by the house arrangement through the front yard, providing privacy to the family and each member. Walls and opening types provide an intimate level of privacy in interior spaces for the individual."

There is a clear differentiation between private and semi-public spaces from visual, acoustic and climatic aspects. Closed social interaction with the neighbours is encouraged with the minimum physical barriers and semi-public open spaces in the house compound.

The houses are designed to accommodate the extended families and to provide proper privacy for women according to the culture of Myanmar. The freedoms of movement and behaviour for women within the compound are a measure of the exclusion of the outside world from the house. The traditional houses provide adequate setting for the living of the family and childcare. The large size and design of the house allow the formation of new families within the same house or compound. Extended families live for years together and the elder are usually taken care by the young. The house is evolving along with the growing and shifting family size and needs.

2.5.3. Cosmological Ideas

The cosmological concept of Buddhist Universe indicate levels or planes and spiritual worlds in a hierarchical nature. The cause and effects of every existence follows the law of Karma.

In the book "The Four Planes of Existence in Theravada Buddhism", Dr. Sunthorn Na-Rangsi explained the concept on the four planes namely the plane of misery, the sensual happy plane, the plane of form and the plane of formless. It is learnt that rebirth and existence are connected in the Buddhist universe.

According to the Chinese Buddhist Encyclopedia, Mount *Meru* is a place which represents the centre of the universe. It is said that its roots is in hell and its summit is in heaven. It is surrounded by seven rings of golden mountains, each of them are separated from the other by one of seven circular oceans. It is flanked by four main continents, each with two subcontinents. The southern continent, *Jambudvipa*, corresponds to the physical earth.

Astrological calculations are made for all important matters in daily life, from choosing business partners to dates for laying the foundation of important buildings. It is

according to the Buddhist cosmological belief to locate the shrine only in the eastern or southern part of the house. In Buddhist cosmology, east and south directions are accepted as sacred. Buddha attained the enlightenment facing the east direction under the sacred Bodhi Tree. At the time of his death, Buddha laid on his right side with his head pointing north and facing west direction.

It is supposed to be auspicious to do or locate things in east and south orientations also because the sun moving in its regular orbit from east to west is regarded as auspiciousness. Many ritual prescriptions surround the construction of a house and the choice of propitious days for beginning the work or taking up occupation. The elaborateness of this system certainly owes something to cosmological ideas.

2.5.4. Traditional Habitation and Kinship

Figure 2.6. Front Yard for Drying Crops and Playing of Children

Throughout the history of Myanmar, Myanmar people are kind and hospitable. They usually live in a compound. Generally three generation live together. In the house form, there has a front yard for drying their crops and for playing of the children.

In the front, there has a family gathering spaces where hosting guests and make chatting. This place may be on raised floor or with the long bench furniture. They spend much time in that place. It is a semi-outdoor living space and is partially enveloped. There is an indoor living space used for worshiping the Buddha, snapping of old people, sleeping of guests and sons, and using as a work place. There may be some furniture such as low round table for studying and raised shaft for placing Buddha image. At day time, living space is also used for living, working, receiving guests, dining, and studying for children.

Figure 2.7. Family and Guests Gathering Space [Field Survey, 2011]

Having a meal is often done in the kitchen or indoor living space using low round table. People sit on small mats around the table. The table can move if it is finished to use. Kitchen and food storage are at the back of the house. Myanmar food is generally bought and cooked fresh, and the older generation particularly prefers shopping to be done every morning. When housewife does the cooking, her family come and make chatting. Cooking area can be found outside the house, or attached to the house. Guests are able to enter the kitchen directly and can chat in the kitchen area. The kitchen is easily accessible. This is the important of social condition for Myanmar people.

Figure 2.8. Cooking in the Front Yard with Large Pans for Donating in the Religious Ceremony [Field Survey, 2011]

Having a bath and washing the cloths are done at the back of the house. They use big sinks and small wells for bathing and washing. They usually use water from well. They also use open space to dry the clothes.

Figure 2.9. Open Air Bath and Laundry Place near a Tube Well in the Back Yard
[Field Survey, 2011]

The orientation is very important in Myanmar traditional houses. In their belief there is the "Head" part (*Gaung Yinn*) and the "Foot" part (*Chay Yinn*) in the house. In the "Head" part, shrine or Buddha image with the common living area is placed and the father or the parents, the masters of the house, sleep. Daughter's bedrooms and kitchen are placed in the "Foot" part.

2.6. Beliefs and Practices in Building a Traditional Myanmar House

There have been traditional rituals controlling the location, orientation and construction of the house practised by their ancestors. These are still practised by most of the house builders and owners. Choosing the auspicious construction time, suitable site layout, fine wood, the right time for erecting the very first post of the house and assembling the stair are controlled by Myanmar traditional customs. For example, there is a belief that choosing the odd number of total treads in a stair makes the house owner prosperous. One thing to be aware is not to set the stair up going in the direction opposite the main front door and in the directions except east and south. It is unusual to divide rooms along the ridge of the roof. This is normally regarded by the ancestors as a hindrance to prosperity of the household.

A traditional measurement system has been using the traditional units in expressing the length. According to Tin Hla, U: (1973), there is a conventional relationship between those traditional standard units. These are:

10 hair = 1 sesame seed

6 sesame seeds = 1 *muyaw* rice

4 *muyaw* rice = 1 *letthit*

8 *letthits* = 1 *mite*

3 *mites* = 1 *taung* (distance between the elbow and middle finger tip of human)

1 *letthit* is approximately equal to 0.7 inch or 1.8 centimetres.

1 mite is approximately equal to 6 inches.

1 taung is approximately equal to 1.5 feet.

There has been a tradition to build the roof part as high as the body part of a single storied house. Here, the roof part is usually identified as *Ah Htat Wa* whereas the body part which covers from the ground level to the roof beam level is called *Aout Wa*. If you look at a traditional Myanmar house, this equal proportion of the heights of *Ah Htat Wa* and *Aout Wa* can be seen as an elegant profile. [Tin Hla, U: (1973)]

Not only for the beauty sake, there also has been an influencing belief on this tradition. The ancient Myanmar people have been avoided building *Ah Htat Wa* much higher than *Aout Wa* or similarly in building the *Aout Wa*. That is because it is traditionally believed that ill luck and poor health will be set upon the inhabitants if doing so. If they are equal or nearly equal in height, it is believed that good luck and prosperity will be brought to all the occupants.

The present day house owners of the common public do not take care with this taboo and are using not much expense of building a high roof. The roof of contemporary traditional houses is found to have an appearance neither too light nor heavy in overall form.

The staircase must be fixed and erected only when it is fully completed. When the stair is finished, ascending should be made first. Descending from the completed stair should not be made before the ascending has first been done. As soon as the stair is finished and fixed, the ascending ceremony is held. There are also some widespread beliefs by the house builders that, the stair must have odd number of steps. Steps in even number are believed to be unfavourable. The traditional formula for counting the steps

orderly in three words is, "*Larban*, *Thukhan*, and *Maranan*" meaning "the rich, the comfort, and the death" respectively. Each step is counted in this order of three, till it comes to the last step and to see which of the three counts falls on the last step. To avoid such unfavourable circumstances, planning the number of steps of the stairs can be prearranged, so that the suitable odd number of steps with the favourable count on the last can be achieved.

When the new house is completed, and is ready to be occupied by the owner, a ceremony is usually made. Normally, a feast of simple meal is offered to the monks, neighbours and friends. It is called a house warming ceremony.

Among the common people, there are still some other beliefs which the reference books did not mention. And those beliefs are sometimes strictly followed by some people. The floor planks are usually arranged along the ridge of the roof. Sleeping across the floor is not favoured by some people, because it is said that, only the dead are placed across the floor in the time of funeral. Some builders and carpenters believe that the fence should not be constructed before the house is completed, and the wall should not be constructed before the roof is completed.

2.7. Summary

The main theme of this chapter is focused on all the traditions and customs which have a strong imprint on the layout of the house, especially the obvious symbolic representations and rituals in the building process in a country where almost ninety per cent of the people are Buddhists. The space we live in, in particular the influence of the belief systems on buildings, is the key to the interpretation of spatial relationships that determine domestic space. A significant corollary to that are rituals, both of daily life and those involved in the process of constructing the dwelling.

"Shei htoun ko le ma pe hnin"

(Do not reject customs and traditions of the past)

"Zei thoun ko le ma lwe hnin"

(Do not spend your household money easily)

These two lines rhyme in the Burmese language, and are said often and easily as a reminder to follow custom and tradition, and to be thrifty with money in running a household. All builders and carpenters have at least some basic knowledge of the rituals associated with the construction of buildings.

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CHAPTER 3
ARCHITECTURAL IDENTITIES OF MYANMAR TRADITIONAL HOUSES IN CENTRAL MYANMAR

3.1. Introduction

In this chapter, architectural identities of traditional Myanmar houses in central Myanmar are introduced. These had been identified according to the previous research work and a field survey (2009 to 2011) which was carried out in approximately 150 traditional houses of 12 towns and villages in central Myanmar.

Section (3.2) discusses the architectural identities in spatial concepts. First part of this includes individual functional spaces such as living space, shrine area, space under the floor, space to take off footwear, multifunctional space. Second part is about divisions of space in spatial composition which is sub-divided into two issues namely: Cultural division of space: “Front” and “Rear” and Cosmological division of space: “Head” and “Foot”. 3.2.3. Third part of Section (3.2) discuss on the architectural identities in concepts of spatial planning. In Section (3.3), there is a discussion on architectural identities in individual architectural elements such as roof, wall, fenestrations, floor, stair and connective elements.

To the whole extent of the confined research area, some house forms and facade compositions are found to be significant according to the literature review and field survey. These house forms have their own significance; some have regional identity whereas some have attained common people’s preference for decades. Section (3.4) mainly discuss on architectural identities in significant house forms. Four distinct house forms are identified as: stilt house in the flood plains, single-storey house with gable roof which is the most commonly found type of all single-storey suburban and rural houses, two-storey house with balcony and houses with combined roof form. There is a conclusion on evaluation of architectural identities of Myanmar houses in central Myanmar in the last part of chapter (3).

3.2. Architectural Identities in Spatial Concepts

In considering the architectural identities in spatial concepts, there are three categories: concepts of individual functional spaces, division of spaces and concepts of spatial planning.

3.2.1. Individual Functional Space

In order to emphasize some fruitful perspectives on the interesting inter-relationship of material, social, cultural and symbolic aspects of space, spatial concepts of individual functional spaces are discovered. These include the most important functional spaces of a traditional Myanmar house. Some other functional spaces of lower priority are not stated under this heading.

3.2.1.1. Living Space

Semi-outdoor living space of a traditional house in a village gives a sense of friendliness and welcome.

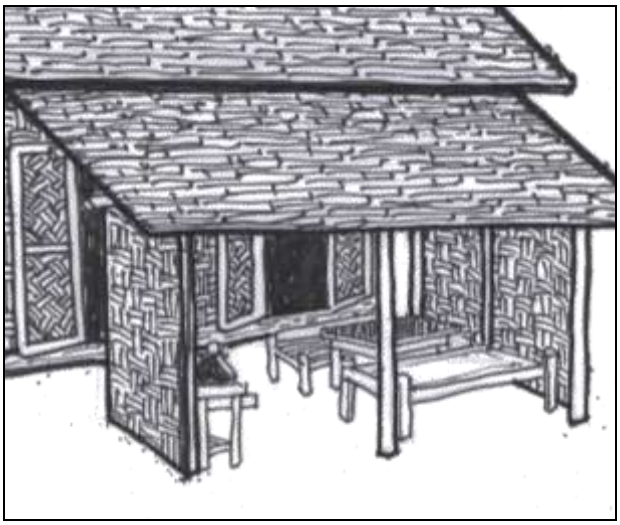

Figure 3.1. Transparency of a Semi-Outdoor Living Space between Interior and Exterior

Outdoor living space in the open air or with a separate pavilion in front of the house is a sign of intimate relation to nature.

Figure 3.2. Open Air Outdoor Living Space under the Shade in the “Head” Part of the House

Generous living furniture: wooden table and settee (comfortable and relaxing environment for the guests)

A shelf for earthen pots of drinking water (Yay Oh Zin), in the living area or with a separate overhanging loggia protruded from the external wall which is in the “Head” and “Front” part of the house (Myanmar hospitality)

Figure 3.3. The Shelf for Earthen Pots of Drinking Water (*Yay Oh Zin*) in the Living Area

Figure 3.4. The Outdoor Living and Informal Guest Receiving Space on Spacious Wooden Deck in Early Traditional House from 1838.

[Source: Photographs of the scale model by courtesy of Department of Architecture, West Yangon Technological University]

3.2.1.2. Shrine Area

- In the easternmost or southernmost and "Front" part of the house as well (reflection of Buddhist cosmological ideas)
- Dominance over other functions by raising the floor level
- Open planned flexible space for occasional religious activities
- Placement of the Buddha statue or image always facing to the west or north (reflection of religious customs)
- Attachment with the multifunctional space without partition
- Emphasis in form by a separate dominating roof or an prominent protruding loggia from the east wall
- Its importance is reflected in the fact that it is often more elaborately carved and decorated than the house itself.

Figure 3.5. Interior (left) and Exterior (right) Views of the Altar of a Two-Storey House

3.2.1.3. Space under the floor

- Airy, sheltered, simple and immensely liveable character in stilt houses and partially walling ground floor of double storey houses (climatic response)
- Transparent cube of space established by free standing timber posts infused with the living customs of Myanmar people

Figure 3.6. Living Space under the Floor Infused with the Traditional Habitation Style

3.2.1.4. Space to Take off Footwear (*Pha Nut Chut*)

- A transition between two different floor levels (reflection of cultural tradition)
- There also exists a cloth for removing the dust from the feet before going upstairs.

Figure 3.7. Space to Take off Footwear at the Base of a Stair Leading to the Balcony

3.2.1.5. Balcony

Figure 3.8. A Commonly Found Balcony Type in the Contemporary Houses in Villages

- An exciting transitional space between interior and exterior (reflection of the ancestors' lifestyle on spacious timber deck)
- Effective sun breaker for the floor just below it (climatic response)
- Often lower in floor level to about half a foot than the main floor level (emphasis on functional importance)
- A sense of transparency between interior and itself
- The total composition would have been incomplete without it.
- Elegance of detail in scale and proportion

Figure 3.9. Details of Carved Pattern on the Balustrade of a Balcony (1949 Completion)

3.2.1.6. Multifunctional space

- Situated mainly in the "Front" part of the
- High significance with great functional value

3.2.1.7. Bed area

Figure 3.10. Sleeping Place in the Multifunctional Space of a House with Raised Timber Floor

- Only one or two bedrooms in case of privacy
- On bedstead in the ground floor and on the bamboo mat in the upper raised floor level
- An area in the multifunctional space occupied only at night

3.2.1.8. Dining and kitchen space

- Attached each other in the “Foot” and “Rear” part, separated from the main house
- An outdoor kitchen usually found near them
- Mostly with wooden table and chairs and sometimes with lower circular wooden table to dine sitting directly on the mat floor

3.2.1.9. Bath and toilet

- Separated from each other mostly in the “Foot” and “Rear” part

3.2.1.10. Front yard

- To serve as a semi-public transition between the community and the house (reflection of culture)

3.2.2. Divisions of Space in Spatial Composition

3.2.2.1.Cultural division of space: “Front” and “Rear”

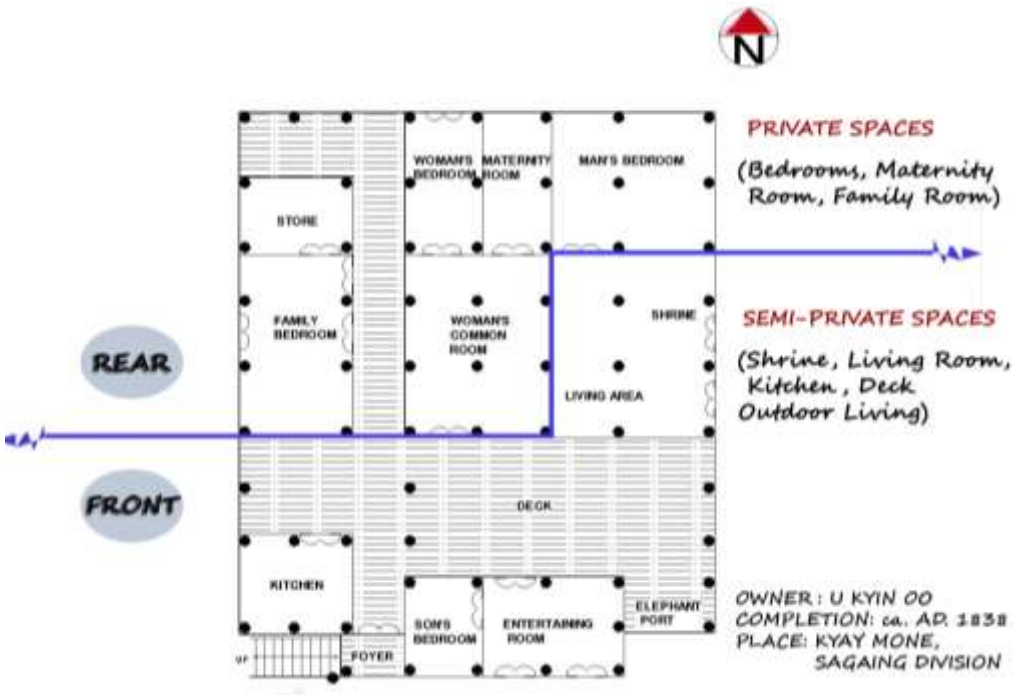

Figure 3.11. Division of Space in a Traditional Myanmar House With Regard To the Cultural Customs

[Source: Measured drawing plan from Myanmar Traditional Houses by Myo Myint Sein, U, and Associates: (1970).]

According to the cultural traditions of Myanmar, the front or entrance part is generally accepted as “Front” part (*Ein Shae*).And another one is “Rear” part (*Ein Nout*). In the planning of an early traditional Myanmar house, private spaces such as bedrooms, maternity room and family room are placed in the “Rear” part. Semi-private spaces such as shrine, living room and deck are in the “Front” part. It is the Myanmar culture to receive and entertain guests mostly in the “Front” part of the house.

Figure 3.11 and Figure 3.12 are showing how space is divided according to the cultural tradition and cosmological concept in an early traditional house of Kone Baung era. The original measured drawing plan was taken from Myanmar Traditional Houses by Myo Myint Sein, U, and Associates: (1970). Here, conceptual development on the division of space: “Head and Foot”, is later added on the original plan by Nandar Linn after the field survey in 2010.

3.2.2.2.Cosmological division of space: “Head” and “Foot”

According to the Buddhist cosmological ideas, the house is normally divided into two parts: “Head” (*Gaung Yinn*) and “Foot” (*Chay Yinn*). It is mainly concerned with the orientation of the house. The eastern part is “Head” part and the western part is “Foot” part in a house orientated along the east west axis. Shrine, men’s bedroom and living room are placed in the “Head” part. Women’s bedroom and maternity room are to be in the “Foot” part.

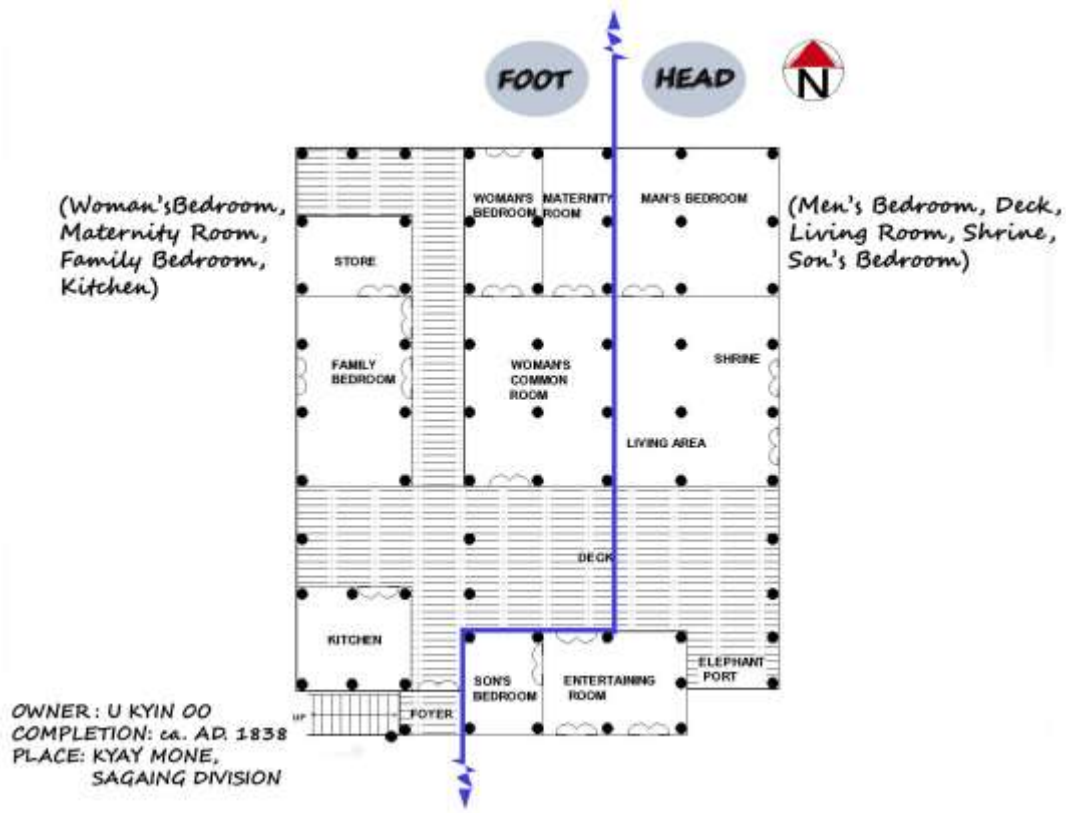

Figure 3.12. Division of Space in a Traditional Myanmar House According To the Buddhist Cosmological Beliefs

[Source: Measured drawing plan from Myanmar Traditional Houses by Myo Myint Sein, U, and Associates: (1970).]

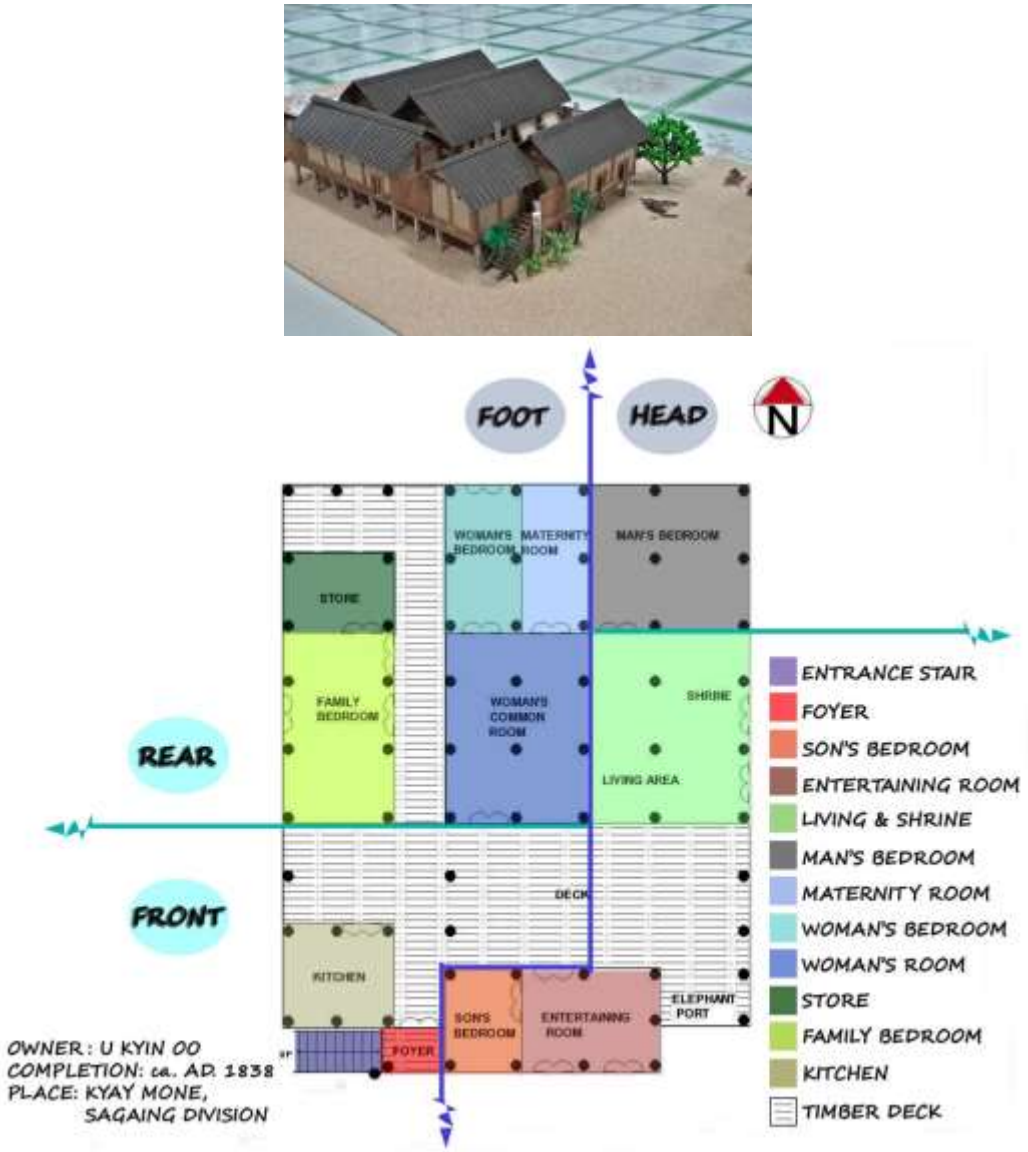

Figure 3.13. Plan arrangement of functional spaces with respect to traditions in a traditional house

[Source: Measured drawing plan from Myanmar Traditional Houses by Myo Myint Sein, U, and Associates: (1970). Photograph of the scale model by courtesy of Department of Architecture, West Yangon Technological University]

Figure 3.13 is showing how space is divided according to the cultural tradition and cosmological concept in the same traditional house of Kone Baung era. The original measured drawing plan was taken from Myanmar Traditional Houses by Myo Myint Sein, U, and Associates: (1970). Concept on the division of space: “Head and Foot”, “Front and Rear”, is later added on the original plan by Nandar Linn after the field survey in 2010.

3.2.3. Concepts of Spatial Planning

- A basic spatial determination in planning and construction (*Pin* in Myanmar)
- Simple plan composition: clear, logical, and expression of simple way of living of Myanmar people
- Openness of planning with minimum use of walls
- Flexibility in planning the interior
- Minimum of personal privacy in planning (reflection of kinship and lifestyle)
- A sense of transparency between outdoor and indoor spaces with use of semi-open interior spaces
- Multifunctional space in the "Front" part of the house
- Changes of floor level to emphasize the functional value

3.3. Architectural Identities in Individual Architectural Elements

Considering the architectural identities of architectural elements, it is intended for the purpose of integrating some or all of them into the design of Myanmar houses in accord with their own appropriateness.

3.3.1. Roof

- Elegant roof proportion to the whole height of the house
- Flat ridge
- Regional identity in using the natural roofing materials (self-coloured material, attractive textural effects and subconscious association with nature)
- Simple gable roof form is widely used.
- Orientation along the east-west axis which is the optimum orientation with respect to regional climate
- Ventilation via roof
- Significance in decorative eave details

3.3.2. Wall

- Ventilation via wall
- Regional identity in using the natural walling materials (an impression of friendliness in their colour and texture)
- Light structure with a thin wall (adaptation to geography and regional climate)
- Significance in decorative wall patterns

- Ventilating friezes with decorative panels

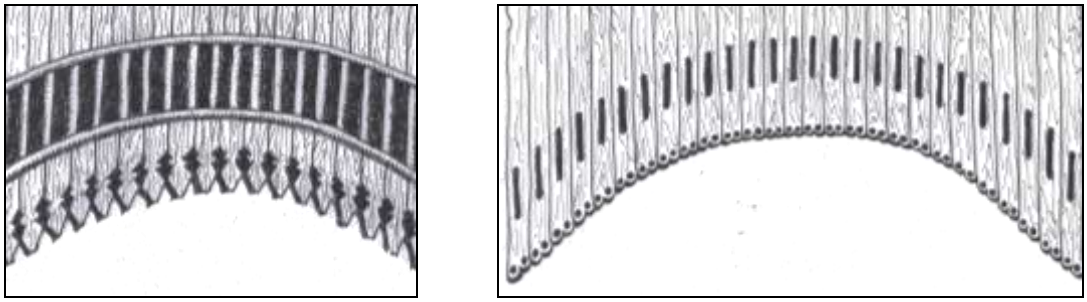

Figure 3.14. Ventilating Frieze Patterns of Wall over Entrance Stair in Contemporary Houses

- Detailed mouldings on the joint concealing (baseboard, floor edge trimmer)
- Facade treatment in early traditional Myanmar houses
- Decorative elements at gable ends

3.3.3. Fenestrations

- Decorative details at the frame
- The arrangement of fenestrations which makes a contemporary traditional house wonderfully light, airy and comfortable to live in

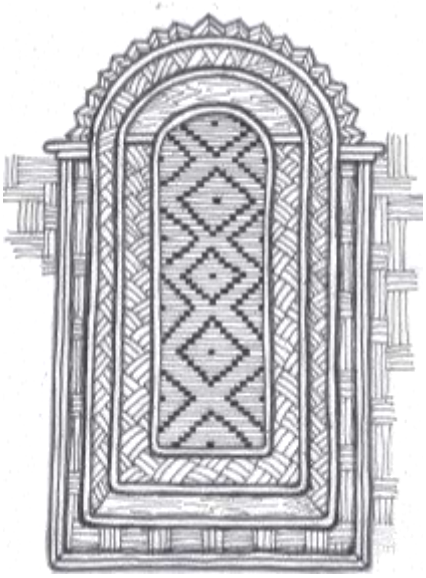

Figure 3.15. Detailed Framing Adornment around the Bamboo Mat Window in a Contemporary House

Figure 3.16. The Usual Type of Fenestrations and Their Effect in the Interior

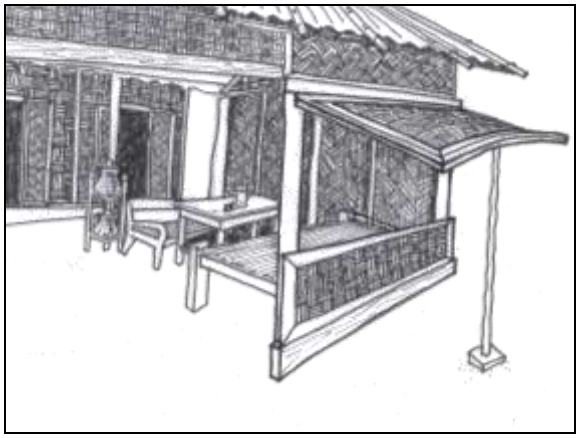

Figure 3.17. Top Hung Awning Window (*Ke Larr*) As a Crude Form of Sun-Breaker

3.3.4. Floor

- The most sacred space, the shrine, has the highest floor level of all (influence of cosmological ideas)
- Stilt on posts or split-levels possessing a range of intangible values grading from ground to the highest floor (influence of cosmological ideas)
- Orientation of the floor planks along the ridge line of the roof (influence of cosmological ideas)
- Timber plank floor (the warmth and friendliness of its the living texture, natural appearance and comfort to walk or sit on)

3.3.5. Stair

- External stair leading to a balcony area
- Always directed towards the east or the “Head” part of the house
- Landing stop at the space to take off footwear (*Pha Nut Chut*) after a few steps

- Balustrades supports scale and point of reference
- Open riser stair

Figure 3.18. Stair at the Entrance to a Contemporary House with Traditional Characters

3.3.6. Connective Elements

- Decorative connection between the two structural components (post and wall, Post and sunscreen, post and beam)
- Expression of the connection between the lower Desire Realm and the upper sacred realms with elaborate wing-like connective elements (reflection of Buddhist cosmology)
- The use of detailed carvings and iconographic figures (reflection of Buddhist cosmology)

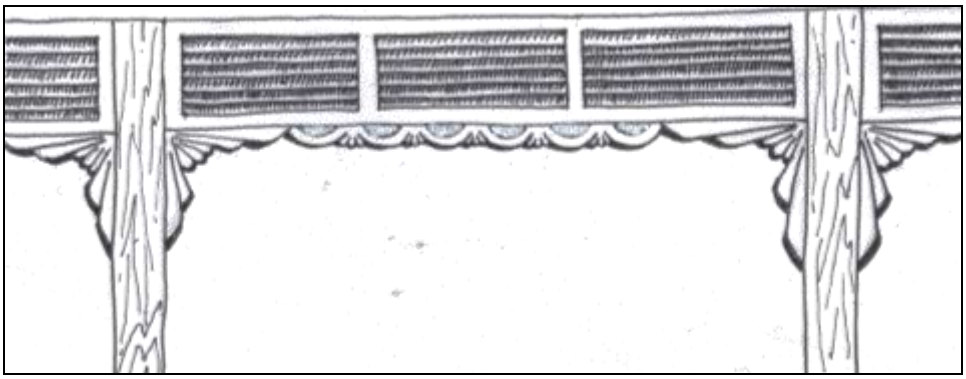

Figure 3.19. Wing-Like Motif of the Decorative Link between the Posts and Sunscreen

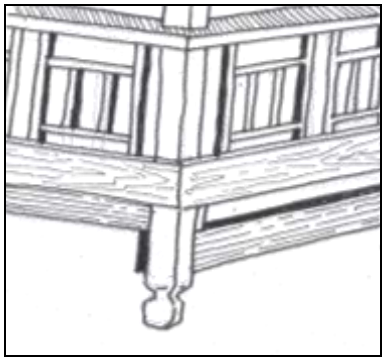

Figure 3.20. Extending Cantilevered Prop Carved at the Lower End of the Junction of Balcony Beams

3.4. Architectural Identities in Significant House Forms

To the whole extent of the confined research area, some house forms and facade compositions are found to be significant according to the literature review and field survey. These house forms have their own significance; some have regional identity whereas some have attained common people's preference for decades.

3.4.1. Stilt House

The stilt houses are typical of traditional houses in the flood plains in central Myanmar. Viewing from aesthetical aspect, free standing timber posts lift the floor off the ground. The house is suspended in the air, away from the ground, while the stair with space to take off footwear (*Pha Nut Chut*) relates between the ground and the house. The lightness of these free standing posts is balanced by the use of traditional roof form and gives a sense of stability and calmness.

In the study of form, visual clue with their proportion is one of the considerable elements. Visual interpretation of a building mainly concerns with proportion. There is a unique proportion between the three constituent portions: post, wall and roof.

Figure 3.21. The Lightness of Free Standing Timber Posts Balancing by the Use of Traditional Roof Form

3.4.2. Single-storey House with Gable Roof (Ein Pasit Tote)

This house form is the most commonly found type of all single-storey suburban and rural houses according to the field survey of various investigation places in the confined research area. The character of the house with lower floor and roof levels in the "Front" part seemed to imitate this appearance and it was normally built beside the main community streets in order to show respect to the officialdoms. It has been a long tradition since that time and present day house owners are still fond of this style of house either they may know its origin or not.

It reflects the traditional Myanmar society and the design of the house as a whole is meaningfully expressing its identity. The simplicity of the design somewhat reveals the humble mind and contentment of Myanmar people. Simple infrastructure of the most common split-level *Ein Pasit Tote* house form can be easily seen as a public shelter at the junction of roads outside a village as shown in the following figure. Travellers can rest or stay overnight there.

Figure 3.22. Simple Structure of the Most Common Split-Level *Ein Pasit Tote* House

3.4.3. Two-storey House with Balcony

Figure 3.23. Commonly Found Two-Storey House Type with Balcony

There is a distinctive use of sustainable language in the design and habitation style of the occupants. The house of this type and form accounts for the vast majority of the various house forms. In the upstairs, there often is a room for storage of crops like granary attached to the multifunctional space which is in the “Head” part including the shrine area. The room in the ground floor is for the private use of family members especially for the daughter. One significant characteristic is; wherever the house is facing to, the stair is always directed towards the east and leading to a balcony before entering the interior. The dining and kitchen is found as separate spaces and therefore, the semi-outdoor living space solely characterizes the hallmark of this traditional architecture.

3.4.4. Houses with Combined Roof Form (Ein Daw Khaung)

After studying the house forms of Myanmar traditional houses in different particular areas of central Myanmar, it is discovered that some houses have similar roof form and building façade, regardless of the time and place in which they were erected. For example, houses with combined *Ein Daw Khaung* style are found in different places of the research areas and they were built in different years within a three-decade period.

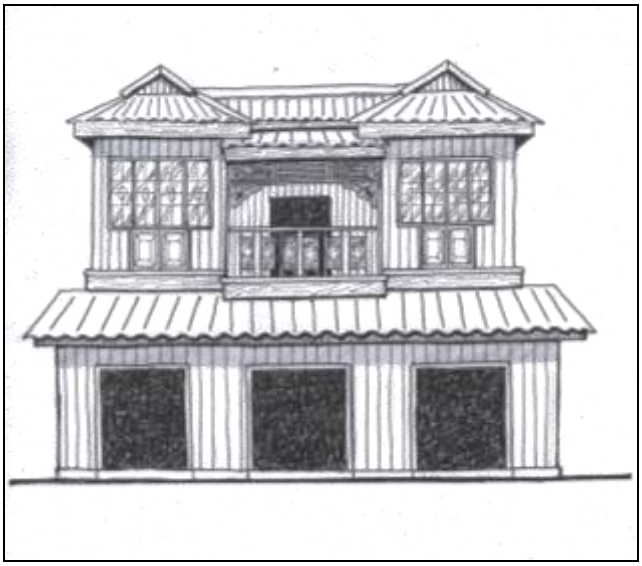

Figure 3.24. Two-Storey Timber House with Combined *Ein Daw Khaung* Style

It is noted that a particular form has retained its identity as it passed about two decades. Without regarding the place of erection, these houses have their own significance over a particular time.

The possible causes are due to the taste of the owners, people's preconceived ideas of their own house based on the experience and perception throughout their life. They might have migrated from one place to another in the regions and built their house as the one of their ancestor's in the old habitat to which they have valued in the past. There may be other house styles like this without any evolution in form over decades.

Table 3.1. Traditional Houses with Similar Facade and Form [Field Survey, 2010-2011]

No.	Existing Place	Completion Time	View to the Facade
1.	Kyaut Yit Village, Myaung Township, Sagaing Region.	1953	
2.	Oh Taw, Amarapura Township, Mandalay Region.	1949	
3.	Kan Kauk Thit, Chan Aye Tharzan Township, Mandalay Region.	1968	
4.	Ponna Kone, Maha Aung Myay Township, Mandalay Region.	1960	
5.	Za Kyann Village, Na Htoe Gyi Township, Mandalay Region.	1957	

3.5. Summary

The elevated floor of traditional Myanmar houses reflects Myanmar people's preference to live on a raised level than on a lowered one from both psychological and cosmological aspects. The split-level floors symbolize the three-tiered concept of Buddhist cosmology, consisting of the Desire, Form and Formless realms. The reflection of this hierarchical existence can be seen in the division of up to three floor levels with respective functional uses. The sacred upper realms are represented with the upper floor levels where the shrine, multifunctional space and often a room for keeping valuables are located. The lowest ground level represents the lowest realm of desire which is regarded to be profane.

Like the universe of the Buddhist cosmology which is arranged in a hierarchy of increasing spirituality and attainment, a traditional house with split-levels or a mezzanine floor possesses a range of intangible values grading from ground to the highest floor.

It seems that the common people might have wanted to use the *Brahma* and *Deva* figures representing the heavenly abodes of the gods and celestials in decorating the roof or uppermost part of their houses. In the sovereignty of feudal kings, discrimination in the society was controlled by a set of laws concerning with dress style, personal utensils, houses, funerals and many other cases. The use of decorative details was restricted by detailed restrictions and these figures were regarded to be belonging to the royal and religious buildings. This became a tradition and they dared not use the direct means of expression although they wished to do. Then, the symbols of the birds like the *Galon* and peacock began to be in use. They are supposed to serve as a link between the desire realm including the abode of human and the realms above it in the Buddhist cosmological universe.

The houses have an intrinsic clarity of structure which is natural and inevitable for the purpose they fulfil. They are in scale with human so that one is secure and at ease in his daily living. They are intimately related to the inhabitants and their immediate environment. Identity is stemming from the unique proportion of the stilt house (proportion between post, wall and roof). The stilt house, itself, as a whole is manifesting the tectonic expressivity of timber. Wherever the houses are facing to, south or north, the stair is always directed towards the east. *Ein Pasit Tote* house form is symbolizing the traditional Myanmar society and humble mind of Myanmar people.

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CHAPTER 4
FIELD SURVEY OF CONTEMPORARY MYANMAR HOUSES IN CENTRAL MYANMAR

4.1. Introduction

In this chapter, two main parts of discussion can be seen. The first part is about the characteristics of field survey. The latter is comprehensive discussion of the findings from the field survey.

In first part, general characteristics of the field survey are introduced first. After that, locations of (7) field survey areas in central Myanmar are listed with the aid of maps. Criteria in selecting sample houses and method of investigation in the field survey are also explained here. Questionnaires used in the survey can be seen in Appendices.

Second part of this chapter is an analysis of the findings from the field survey. Firstly, general characteristics of contemporary Myanmar houses in the field survey areas are briefly introduced. Spatial composition of functional spaces in contemporary houses in the survey areas is analysed in section (4.3.1). In section (4.4), multifunctional or mixed–use space which is commonly found in contemporary houses is analysed in a number of aspects.

Different types of multifunctional space recorded in the survey are classified and illustrated with sample house plans. There are (7) types of multifunctional space in total. After that, percentage of presence of multifunctional space in the surveyed houses and area of multifunctional space by percentage of habitable floor area are calculated from the survey data. The average duration of time spent in the multifunctional space by household members is described under the topic of time-related usage of multifunctional space. In section (4.5), reflection of changes in life pattern and facilities in contemporary houses is discussed compared to those of traditional houses. In section (4.6), the most common spatial composition is studied from each research area taking the construction cost of each house as a basis reference for selection. Section (4.7) is a discussion on commonly used building materials and technology in the research areas according to survey data. Finally, there is a conclusion remark on the field survey and its findings at the end of this chapter.

4.2. Characteristics of Field Survey

The survey was carried out from December 2015 to February 2016, for a total of (298) houses in (7) towns in central Myanmar. The primary purpose of the research is to study the contemporary trend of Myanmar houses. Studying the spatial compositions in present-day houses is a crucial part of the survey. There are a total of (298) surveyed houses in (7) no.s of research areas.

Spatial compositions of houses in the research areas were surveyed by making layout measurements, drawing sketches of plan composition, taking photographic records and visual survey on the usage and composition of spaces inside the house, conducting verbal interviews with the residents of each house.

To achieve the rational results, the most common house types of the general public should be carefully selected and considered. For the selection of case study houses from each research areas, the construction cost of each house is taken as a basis reference. All surveyed houses are analytically reviewed from these records. Meanwhile, important factors such as cultural, religious, social, economic and climatic influences at the time of survey are also taken into consideration to become a rational outlook.

4.2.1. Location of Field Survey Areas

Survey area in central Myanmar includes 3 towns (Mandalay, Meikhtila and Myittha) from Mandalay Region, 2 towns (Chauk and Magway) from Magway Region and 2 towns (Monywa and Shwebo) from Sagaing Region.

There are a total of 298 houses surveyed houses in the above 7 research areas, approximately 40 houses in each area.

1. Mandalay – 43 no.s
2. Meikhtila – 43 no.s
3. Myittha – 43 no.s
4. Chauk – 40 no.s
5. Magway – 44 no.s
6. Monywa – 44 no.s
7. Shwebo – 41 no.s

Total – 298 no.s

Research areas in Mandalay Region are:

(1) Mandalay City (suburban areas)

(2) Meikhtila Township

(3) Myittha Township

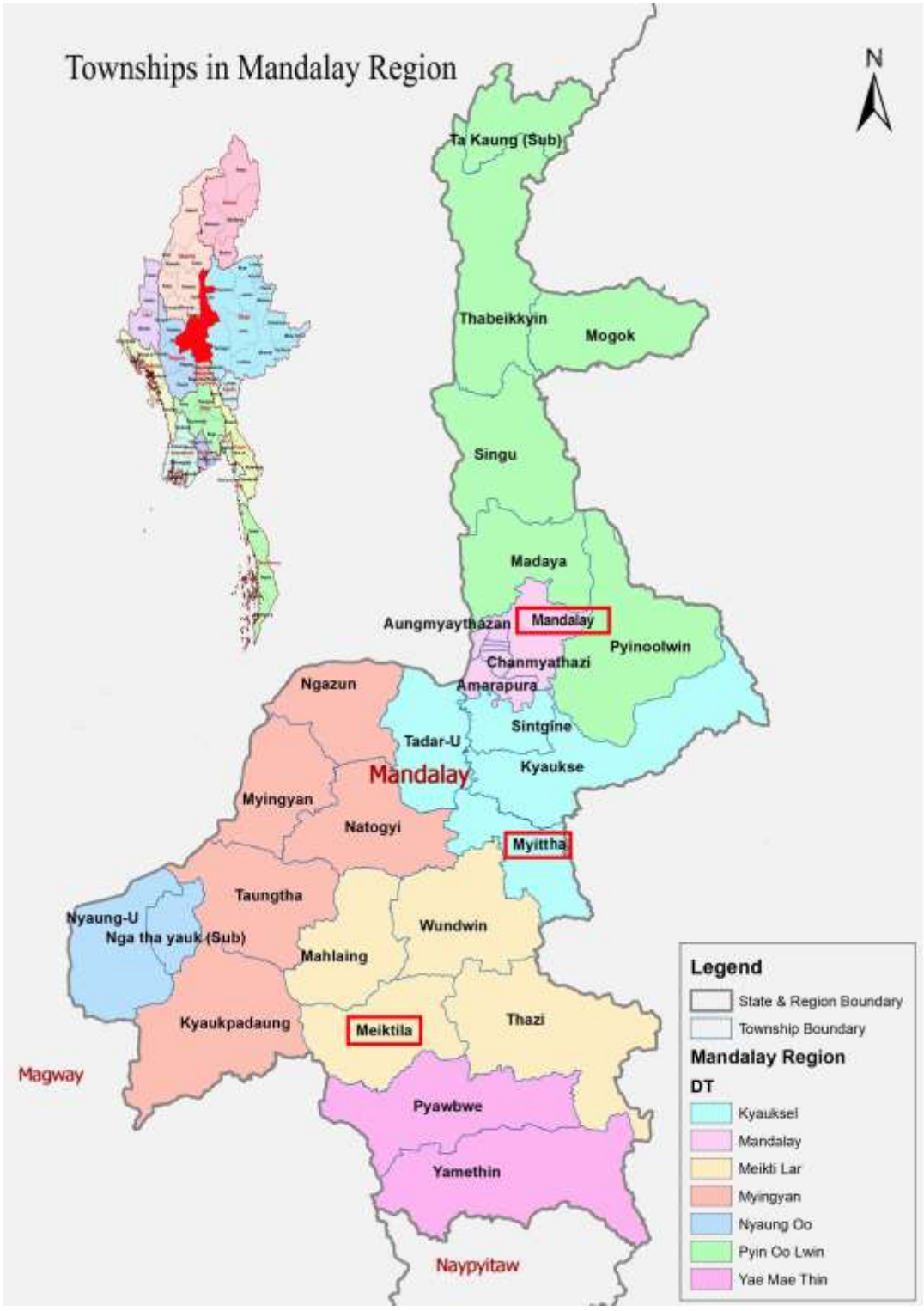


Figure 4.1. Location of Research Areas in Mandalay Region

[Source: The 2014 Myanmar Population and Housing Census]

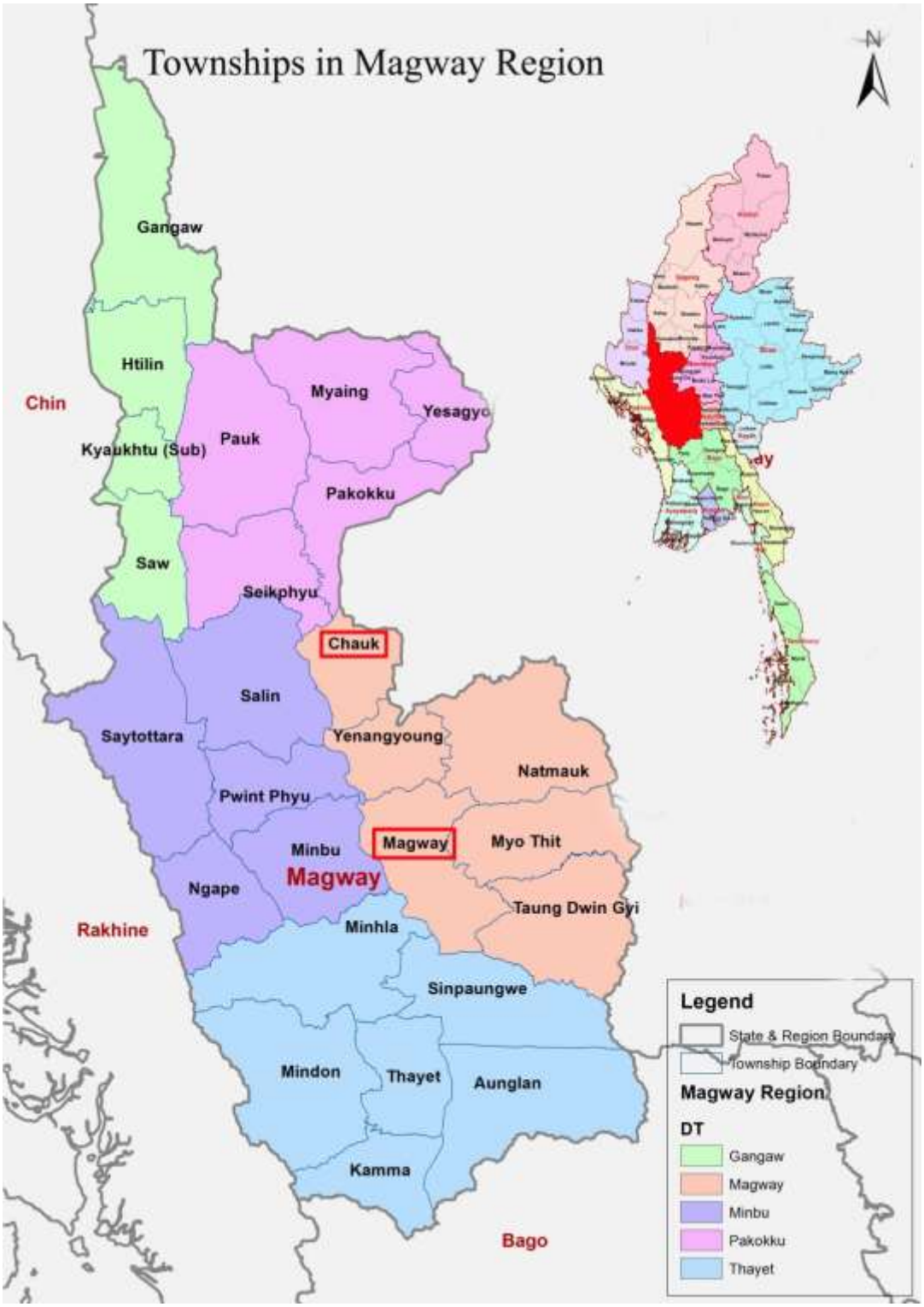


Figure 4.2. Location of Research Areas in Magway Region

[Source: The 2014 Myanmar Population and Housing Census]

Research areas in Magway Region are:

(1) Magway Township

(2) Chauk Township

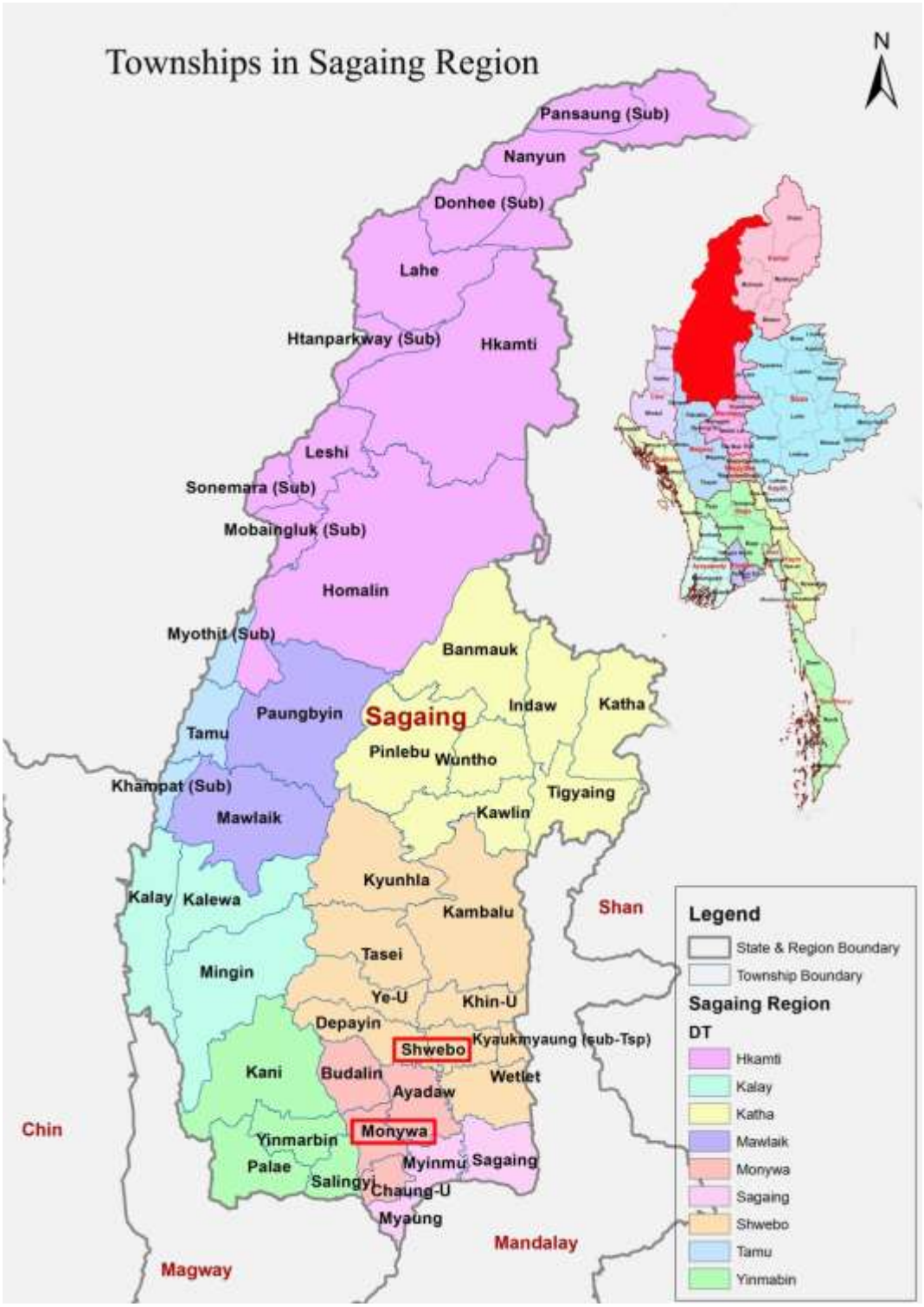


Figure 4.3. Location of Research Areas in Sagaing Region

[Source: The 2014 Myanmar Population and Housing Census]

Research areas in Sagaing Region are:

(1) Monywa Township

(2) Shwebo Township

4.2.2. Criteria in Selecting Sample Houses

The surveyed houses in the research areas were selected according to the following criteria.

In selection of houses for the survey, detached houses most of which were built on their own lots or yards with or without fences were preferably chosen. Houses which were constructed from around the year 2000 to the time of survey were confined for the survey so as to get the most recent data of the present-day houses. The survey was carried out from December 2015 to February 2016.

Houses of common people whose income level is neither too low nor too high were targeted to conduct the survey. The house should be one where people are actually residing at the time of survey or where people lived at least once after it had been completed in order to know the actual living style. The houses local residents introduced to get in and those houses their owners allowed to conduct the survey in their houses were included in the list.

4.2.3. Method of Investigation

First, each house was investigated visually on the utilization and composition of functional spaces. Then, measuring the layout and drawing sketches of the plan composition were made. Photograph records of the house were also taken for analysis of the spaces and creation of drawings later on. Finally, visual survey inside the house and interviews with residents were conducted on the household and their daily living the house. Some other items included in the survey are occupation and income level of the household, number of family members, usage of building materials and approximate cost of the house at the time of construction. Questionnaires used in the survey are described in Appendices.

4.3. General Characteristics of Contemporary Houses

Average conventional household size of the research areas is about 4.1 to 4.6 persons in a house [Population Census, 2014]. Occupation of head of the household or the main business of the whole family varies from civil servants, teachers, company employees to retired persons and mostly involves in private business.

Among the 298 households of surveyed houses, about 99% are Buddhist. Every Buddhist family has a shrine space housing an altar with at least a Buddha statue. Social interaction within the community seems to be well maintained among the families.

The houses in the survey areas are built with common building materials such as wood, bricks and reinforced concrete. There are a considerable number of houses which are constructed of steel framing for the whole structure especially for the columns, beams, wall frames and roof frames.

To respond the hot and dry feature of the climate in central Myanmar, cool air is favoured and space organization in the house is with minimum partitions, allowing maximum flow of cross-ventilation. There are semi-outdoor living areas in most of the houses attached to the house under the same roof or separated from the house under a shade.

4.3.1. Spatial Composition of Functional Spaces

These are classified according to the visual survey inside the houses and interviews with the households on their daily life style. Interview questions on daily life pattern such as where the family gather together, where they sleep, where they eat, where they pray, where they receive their guests and where they spend most of the time in the house were made during the survey.

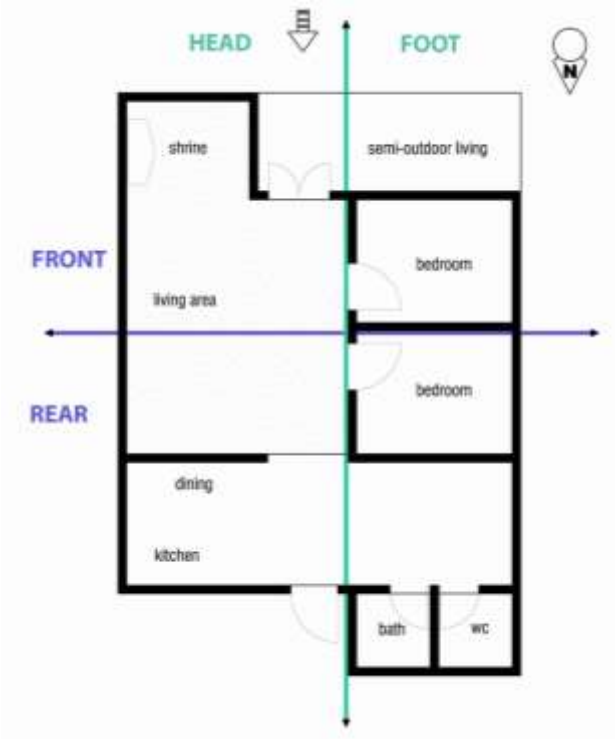


Figure 4.4. Cultural and Cosmological Division of Spaces in a Sample House

According to the survey, there are a number of houses in which spatial composition is formed with separate individual functional spaces while many of them have different kinds of multifunctional spaces. Multifunctional space here simply means a

spacious common space where different functional areas exist together adjacent to each other. Or sometimes different activities may be performed only in one space at the same time.

4.4. Multifunctional or Mixed –use Space

In single storey houses, a multifunctional space is usually formed when guest receiving area, family living area and shrine area coexist together without any vertical division among them. One main reason of a spacious area needed around the shrine and living area is for housing as many guests as it can in times of special religious occasions. Family living area is commonly found just around the guest living space and in many of the houses, the same living area is found to be used for both family gathering and guest receiving.

In two or more storey houses, shrine area is mostly in the upper floors and there is a spacious multifunctional space around it. This multifunctional space is mainly intended for ritual religious occasions. It is also used as a place to sleep for overnight guests or relatives visiting the house sometimes.

4.4.1. Types of Multifunctional Space

There are 7 types of multifunctional spaces found in the survey houses from all research areas.

Type (1). Family Living and Shrine Areas in a Space

Figure 4.5. Single storey RCC building in Mandalay (Completion in 2007)

In this typical house composition, guest living area, family living area and shrine area are located in a common space without any partition wall. Orientation is in the southwest in this case but there will be a variety of orientation in different houses. This multifunctional space located in the “Head” part and “Front” part of the house. Shrine area is on a slightly raised wooden floor of about 100 mm. This wooden floor area is used for shrine and family living functions.

Type (2). Family Living, Shrine and Dining Areas in a Space

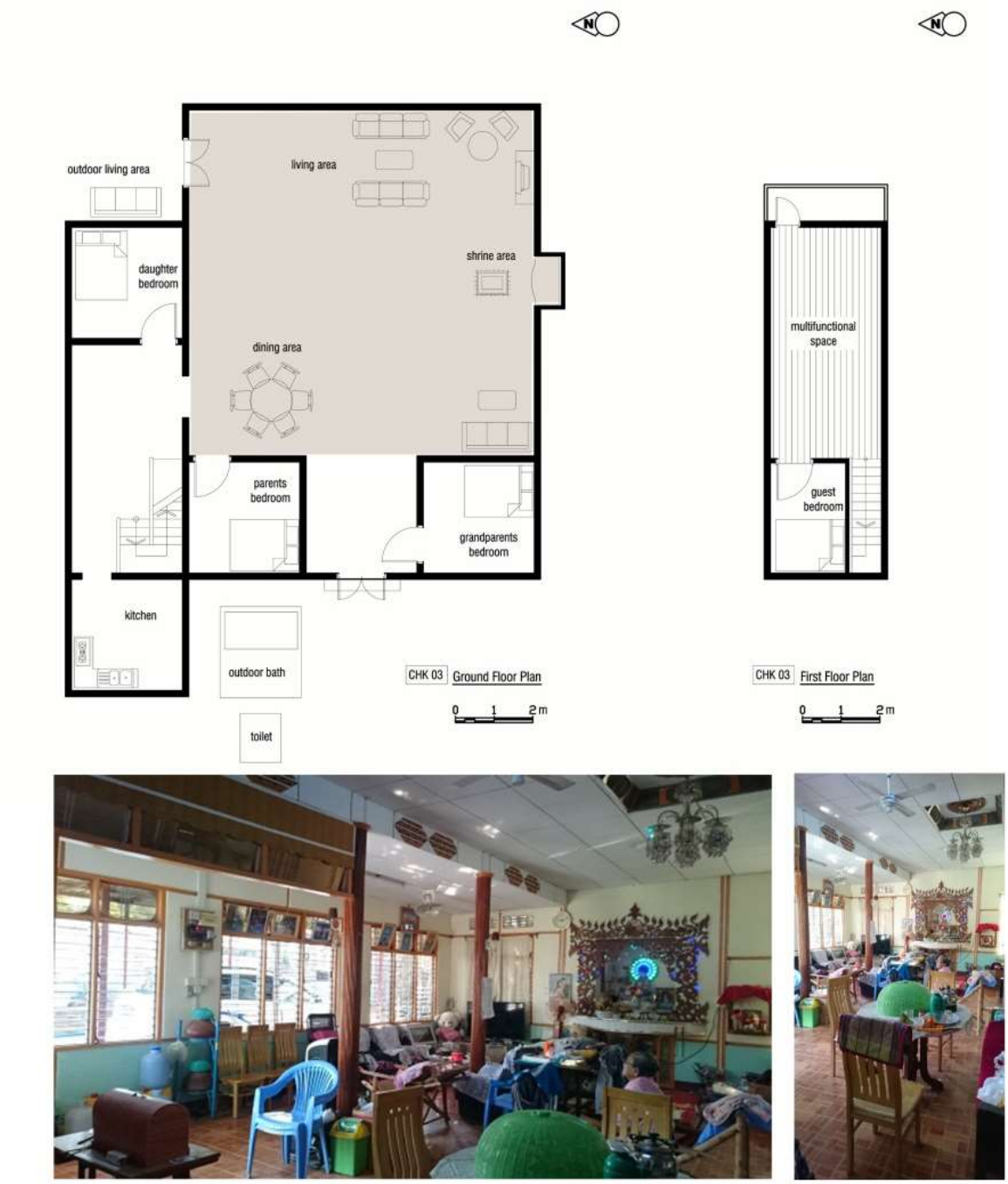


Figure 4.6. Two storey Brick Nogging Building in Chauk (Completion in 2010)

In this typical spatial composition, guest receiving area, family living area and dining area are found existing together in a single multifunctional space. It is in the southeast orientation in this house layout, locating in the “Front” part and “Head” part of the house according to the cultural division of space.

Type (3). Family Living, Shrine and Sleeping Areas in a Space

Figure 4.7. Single storey Brick Nogging building in Chauk (Completion in 2005)

In this single storey house style composition, guest receiving area, family living area, shrine and sleeping area are in a spacious multifunctional space. Sleeping area is used for guest sleeping purpose. In this case study house, most part of the house is on a raised wooden floor while bathroom, kitchen and dining area are on a masonry floor. This type of spatial organisation is the found to be the third common case in the single storey houses. The space is located in the “Head” and “Front” parts of the house.

Type (4). Family Living and Dining Areas in a Space

Guest receiving, family living and dining functions are existed connected to each other in a single multifunctional space. Orientation is in the northeast in this case. Because of the nature of the guest living function, this kind of multifunctional space is always located in the “Front” part of the house.

Figure 4.8. Single storey RCC building in Mandalay (Completion in 2015)

Type (5). Family Living, Shrine, Dining and Sleeping Areas in a Space

Only a few numbers of houses are found to be this spatial composition type. The whole space occupies the “Front” and “Head” parts of the house. In this case study house, shrine and family living areas are on a raised wooden floor of about 100 mm above the main floor level. This type of space utilization is supposed to be developed according to the living customs and preference of a particular people living there and not originally constructed to use that many functions in a single common space.

Figure 4.9. Single storey Brick Nogging building in Meikhtila (Completion in 2000)

Type (6). Combined Multifunctional Space with Shop or Business Areas

This typical space composition is mainly composed of a sale area of a shop or business area in house together with a guest receiving area. This type is representing only a few numbers and mostly found in two or more storey houses. This type of house is used to be constructed originally for the purpose of utilization as a shop house. Needless to say, it is in the “Front” part of the house solely because of the semi-public nature of the business function.

Figure 4.10. Two storey RCC building in Myittha (Completion in 2015)

Type (7). Multifunctional Space around Shrine Area

This type of space composition is mostly found in two or more storey houses for the reason it needs a plenty of floor area. Normally, this is only one shrine function housed in a spacious hall –like space. This space is used for various religious and occasional activities very often in addition to the daily praying purpose. The customs of Buddhist Myanmar people deep rooted in the religious and cultural traditions make this a dream space to be included in their house for the house owners who can effort. It is

obviously found in the “Head” and “Front” part of the house, usually on the upper floors.

Figure 4.11. Three storey RCC building in Mandalay (Completion in 2016)

4.4.2. Percentage of Presence of Multifunctional Space in the Surveyed Houses

Table 4.1. Presence of Multifunctional Space in Single Storey Houses

Sr. No.	**Research Area**	**No. of Single Storey Houses**	**Houses with Separate Functional Spaces**	**Houses with Multifunctional Spaces**						
				Type 1	Type 2	Type 3	Type 4	Type 5	Type 7	**Total**
1	Mandalay	14	2	6	3	2	1	-	-	12
2	Meikhtila	31	4	19	2	3	1	2	-	27
3	Myittha	27	1	19	4	2	-	1	-	26
4	Chauk	20	1	12	3	2	-	1	1	19
5	Magway	27	1	15	3	1	3	2	2	26
6	Monywa	24	3	14	3	3	1	-	-	21
7	Shwebo	18	-	12	1	4	-	-	1	18
Total		**161**	**12 (7.4 %)**	97	19	17	6	6	4	**149 (92.6 %)**

Data Collected in Field Survey (2015-2016)

Table 4.2. Presence of Multifunctional Space in Two or More Storey Houses

Sr. No.	**Research Area**	**No. of 2 or more Storey Houses**	**Houses with Separate Functional Spaces**	**Houses with Multifunctional Spaces**						
				Type 1	Type 2	Type 3	Type 4	Type 6	Type 7	**Total**
1	Mandalay	29	4	6	-	-	3	5	11	25
2	Meikhtila	12	4	1	-	-	1	-	6	8
3	Myittha	16	3	-	-	-	1	1	11	13
4	Chauk	20	3	2	1	1	1	-	12	17
5	Magway	17	2	-	-	-	-	-	15	15
6	Monywa	20	4	1	-	-	2	-	13	16
7	Shwebo	23	1	2	-	-	-	1	19	22
Total		**137**	**21 (15.3 %)**	12	1	1	8	7	87	**116 (84.7 %)**

Data Collected in Field Survey (2015-2016)

From the field survey data, the presence of all types of multifunctional space is 92.6% in 161 single storey houses and 84.7% in 137 two or more storey houses in the survey areas. Therefore, it is supposed to be the most dominant space in spatial composition of present-day houses.

4.4.3. Area of Multifunctional Space by Percentage of Habitable Floor Area

Table 4.3. Floor Area Ratio of Multifunctional Space in Two or More Storey Houses

Sr. No.	**Research Area**	**Houses with Multi-functional Spaces**	**Mean Value of Floor Area Ratios (Multifunctional Area : Habitable Floor Area)**						
			Type 1	Type 2	Type 3	Type 4	Type 6	Type 7	
1	Mandalay	25	0.30	-	-	0.31	0.45	0.36	
2	Meikhtila	8	0.28	-	-	0.28	-	0.30	
3	Myittha	13	-	-	-	0.24	0.42	0.35	
4	Chauk	17	0.33	0.53	0.65	0.35	-	0.36	
5	Magway	15	-	-	-	-	-	0.32	
6	Monywa	16	0.35	-	-	0.31	-	0.36	
7	Shwebo	22	0.26	-	-	-	0.50	0.28	
Mean Ratio			**0.31**	**0.53**	**0.65**	**0.30**	**0.46**	**0.33**	

Data Collected in Field Survey (2015-2016)

4.4.4. Time-related Usage of Multifunctional Space

To evaluate the degree of importance of a space, assessment should be made on how long and how many times per a day it has been using by the household. From the interviews with the residents on their daily time-related usage of different functional spaces, it is learnt that they spend most of their time in multifunctional space on a daily basics. It is a space of high significance with great functional value in everyday life of Myanmar people from cultural point of view.

4.5. Reflection of Changes in Life Pattern and Facilities

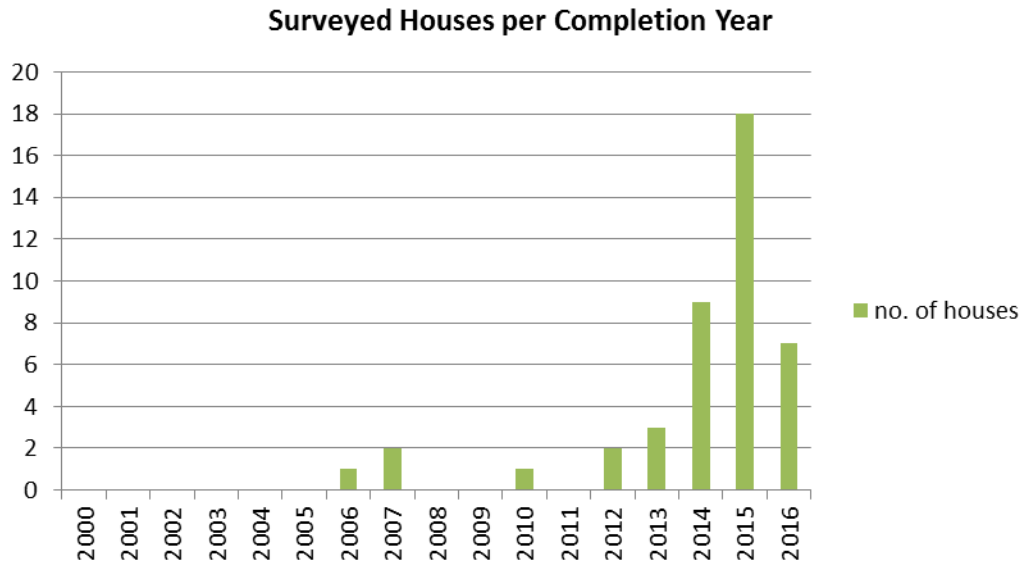
There are some transformations by addition and division of spaces in contemporary houses according to the changes in life pattern and advanced facilities. This enables to increase the utilized space in the house and provide some personal privacy for each inhabitant. But, spatial arrangement in the house is not in systematic approach from architectural point of view.

A number of contemporary houses in the research area is transforming along with the changes of functional space especially in their interior to house the present day household facilities. As the reflection of advanced living facilities and life style of the inhabitants, the houses may need extra division of space than before.

4.6. The Most Common Spatial Composition

In order to know the most common spatial composition form in the surveyed houses, (7) sample single storey houses are chosen from each of the survey areas to compare the plan composition.

According to the surveyed data collected from Myittha Town, the numbers of houses in their respective completion years are as follows.



(43 no.s in total, 27 one storey houses and 16 two or more storey houses)

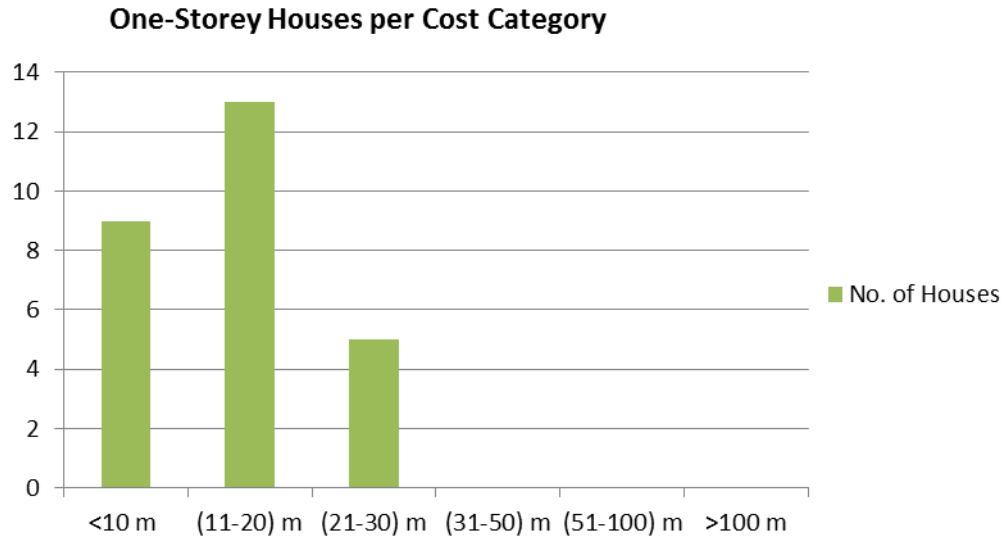
To get the generalized result for a rational research, the sample houses are considered to be chosen from most common group.

Considering from the cost of construction, six categories are divided.

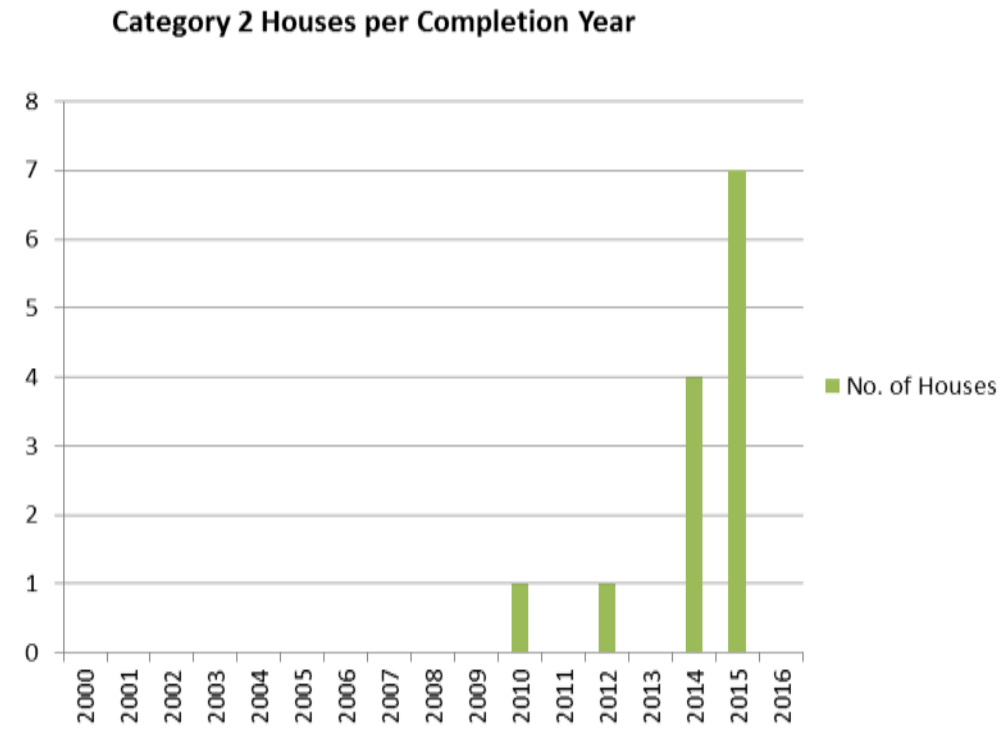
1) Less than or equal 10 million kyats
2) 11 to 20 million kyats
3) 21 to 30 million kyats
4) 31 to 50 million kyats
5) 51 to 100 million kyats
6) Greater than 100 million kyats

The currency exchange rate is 1 yen = 12 kyats (1 kyat = 0.00076 USD) (February, 2018)

In the case of **one storey** houses,

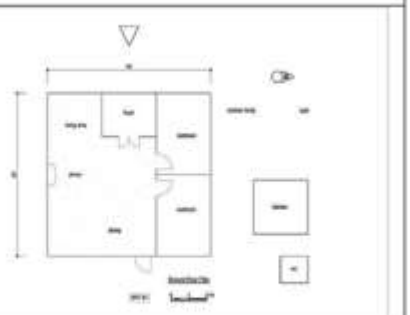
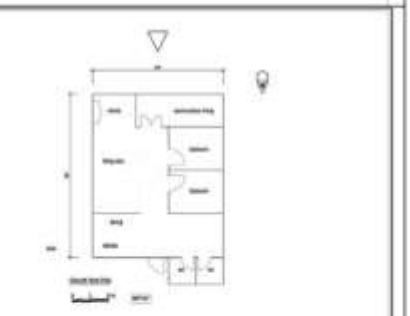
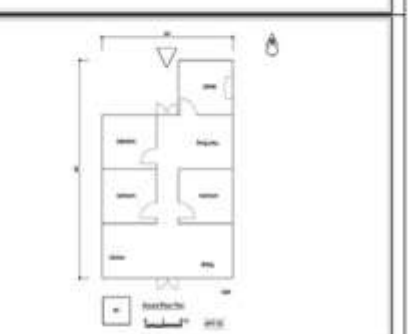


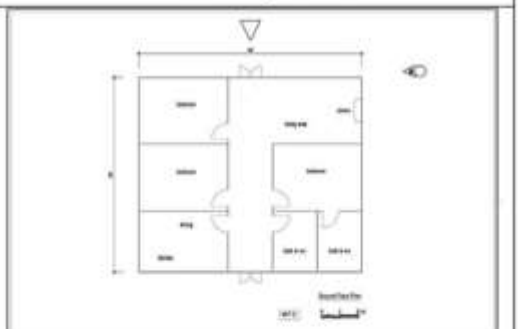
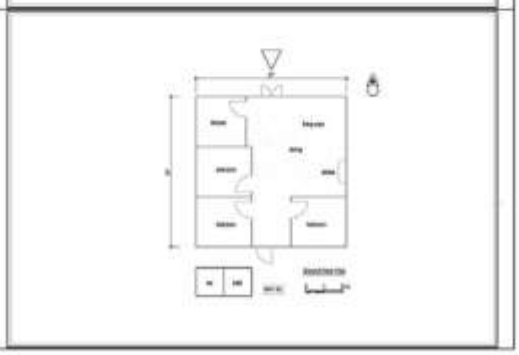
The maximum number of (13) houses are in category 2.



The following table is showing floor plans of (7) single storey houses completed in 2015, with construction cost of (11 to 20 million kyats) each.

Table 4.4. Seven Single Storey Houses Completed in 2015

No.	Structure Type	No. of Household	Multifunctional Area	Plan Composition
1	RCC	M=2 F=2	Shrine Living Dining	
2	Brick Nogging	M=1 F=2	Shrine Living	
3	Brick Nogging	M=2 F=2	Nil	
4	Brick Nogging	M=1 F=2	Shrine Living	

No.	Structure Type	No. of Household	Multifunctional Area	Plan Composition
5	RCC	M=1 F=2	Shrine Living	
6	RCC	M=2 F=3	Shrine Living	
7	Brick Nogging	M= 1 F=3	Shrine Living Dining	

The most common plan composition is combined shrine and living areas in a multifunctional space, which follows the Type (1) style multifunctional space composition. There may be two or three bedrooms depending on floor area and number of household. Toilet facility and bath place are usually separated from the main building.

Figure 4.12. The Most Common Plan Composition House

4.7. Commonly Used Building Materials and Technology

Commonly used materials in the surveyed houses are corrugated galvanised iron sheets, coloured aluminium-zinc sheets and reinforced concrete slabs for roof, timber truss frames and steel truss frames for roof structure, brick walls with timber or reinforced concrete post and beam system, concrete and wood materials for floor, reinforced concrete footings for foundation. Doors and windows are commonly framed with timber. Doors are panelled with timber. Windows are largely made of timber sashes. There are a considerable number of houses which are constructed of steel framing for the whole structure especially for the columns, beams, wall frames and roof frames.

4.8. Summary

Multifunctional spaces are formed in the Front and Head part of the house composition due to the functions they serve. Some houses may have a modified ceiling over the multifunctional space higher than the rest. But, there is very little number of such houses found in the survey.

Although guest receiving is one of the composite functions, the whole space is mainly used as a family living space most of the time. So, the nature of the space is semi-private. When the guest is received in this area while other family members are staying there, it would be a clash between the two functions.

One socio-economic related issue is the decreasing household numbers when working age people are staying away from home for work. If there are only aged parents left at the house, they use to live and eat in a multifunctional space for most of the time of a day. According to the interview results, aged parents normally prefer to dine and to relax in a particular semi-private space so that they can see other family members and guests.

If there is an aged parent or grandparent who needs special health cares at home, his bed is usually placed in a multifunctional space near the family living area in order to be watched over all the time. The aged parents can also see and contact everyone without needing special effort and time. Their feeling of loneliness can be reduced by either seeing the other family members or talking to them at any time. On the other hand, for some privacy reasons, it can be considered inappropriate to place an aged parent bed near a living area. Similar advantages and disadvantages happen in the case of looking after

the kids in a multifunctional space. This is a reflection of the kinship and family lifestyle without much need of individual privacy.

Very high price of land, building materials and construction labour cost is one of the influencing factors that is shaping the size and structure of a house. When the available floor area is strictly limited by the high rate of construction cost, openness of planning with least vertical dividers came into existence. Partition into small separate functional rooms is unfavourable when the floor area is very limited. And it may sometimes obstruct the cross-ventilation within the house. For these reasons, a multifunctional space has become the most common and easily recognized character of a present-day Myanmar house.

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CHAPTER 5
COMPARISON OF ARCHITECTURAL CHARACTERS BETWEEN TRADITIONAL AND CONTEMPORARY HOUSES IN CENTRAL MYANMAR

5.1. Introduction

According to a field survey in 2010 which was carried out in approximately 150 traditional houses of 12 towns and villages in central Myanmar, architectural characters of traditional houses were identified [Nandar Linn, 2011].

In this chapter, characteristics of contemporary houses analysed from the recent field survey in 2015-2016 are compared with those of traditional houses in the same research area. Section (5.2) is showing a comparison with an early traditional house completed in 1838, mainly from the point of view of spatial composition. Section (5.3) is a comparison with a village traditional house completed in 1953, from the aspects of functional spaces, open floor plan and level of privacy. Section (5.4) discusses multifunctional space in a typical single storey traditional house comparing to that of a contemporary house in the same research area. Conclusion section makes an evaluation and remarks on the comparison of spatial compositions and life style along with the passing of time.

5.2. Comparison with an Early Traditional House Completed in 1838

The axial composition style from the front semi-private spaces to the rear private spaces can be seen in both plans. Shrine and formal guest receiving areas are in a multifunctional space.

Cultural division of space is still practiced in the contemporary house plan. From the aspects of cosmological division of space, daily life spaces like dining and kitchen are in the Head part, which are in the Foot part in the case of an early traditional house. Most contemporary houses are not following this rule in the planning of daily life spaces. This is not because of the scarcity of land, but because of the change of people's perception on a traditional belief.

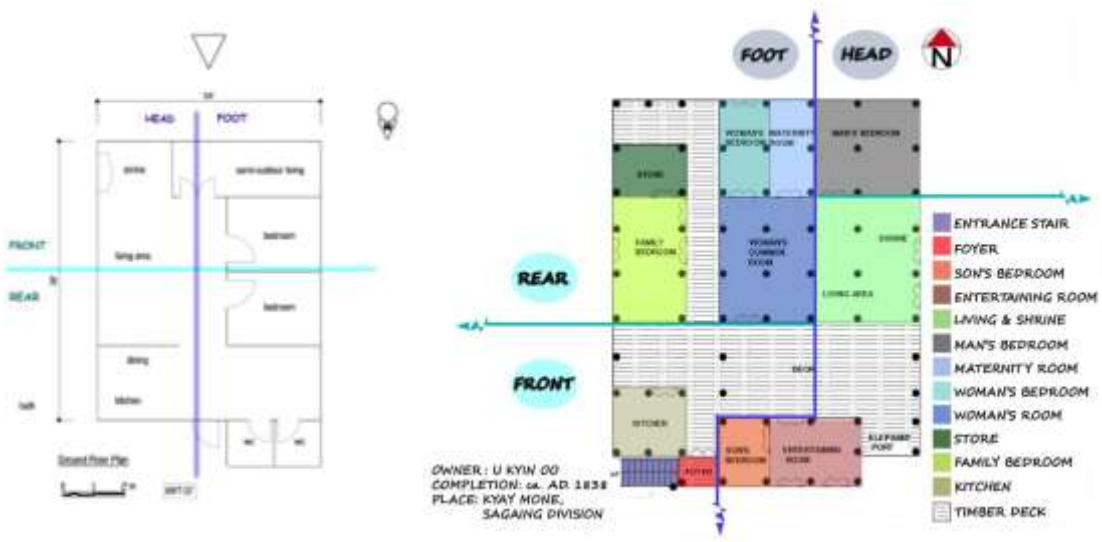

Figure 5.1. The Most Common House Plan (2005 Completion) on the Left and Early Traditional House Plan (1838 Completion) on the Right

[Source: The Right measured drawing plan from Myanmar Traditional Houses by Myo Myint Sein, U, and Associates: (1970).]

In the late Kone Baung Era, according to the literature and empirical evidences of some traditional houses built in the 1880s, it is found to be three types of residential zone namely the private, semi-private and semi-public. Here, some interesting spaces are maternity room in the private zone, guest bedroom in the semi- private zone, entertaining room, deck and space under the house in the semi-public zone.

Table 5.1. Zoning Categories and Functional Activities in Houses of the Late *Kone Baung* Era [Field Survey, 2010]

No.	Zone	Space Utilization	Functional Activities
1.	Private	Bedroom Maternity room Store Family room	Sleeping of household Women's delivery To store house wares Multipurpose for household

2.	Semi-private	Living room Shrine Guest bedroom Kitchen Bathroom	Receiving guests Worshiping For overnight-stay guests or unmarried son Cooking Basic essential function
3.	Semi-public	Entertaining room Deck Space under the house Front yard	Viewing space to entertainments Doing housework, family gathering at nights Working, storing farm wares Playground for children, processing of agricultural products

In contemporary traditional houses, there also are three types of zone as in an early Myanmar traditional house. Here, one interesting space is the multifunctional space in the semi-private zone. It is evolved according to the advanced and practical requirements of contemporary lifestyle and the influence of changes in socio-economic factors.

Table 5.2. Zoning Categories and Functional Activities in Contemporary Houses [Field Survey, 2015-2016]

No.	Zone	Space Utilization	Functional Activities
1.	Private	Bedrooms Store	Sleeping of household To store house wares
2.	Semi-private	Living room Shrine Multifunctional space Kitchen Bathroom	Receiving guests Worshiping Multipurpose for household Cooking Basic essential function

3.	Semi-public	Balcony Outdoor living Space under the house Front yard	Resting, viewing Receiving guests Working, storing farm wares Playground for children, processing of agricultural products

The analysis of space utilization and zoning arrangement in traditional houses with regard to the social and cultural lifestyle of Myanmar people gives a deep understanding of their traditional attitude and way of living. Although traditional habitation seems to remain constant without much change through ages, functional requirements and utilization of spaces have changed a lot. It can be seen clearly that some functional spaces in early traditional houses do not find their places in contemporary house planning when the concept of zones is supposed to be the same.

5.3. Comparison with a Village Traditional House Completed in 1953

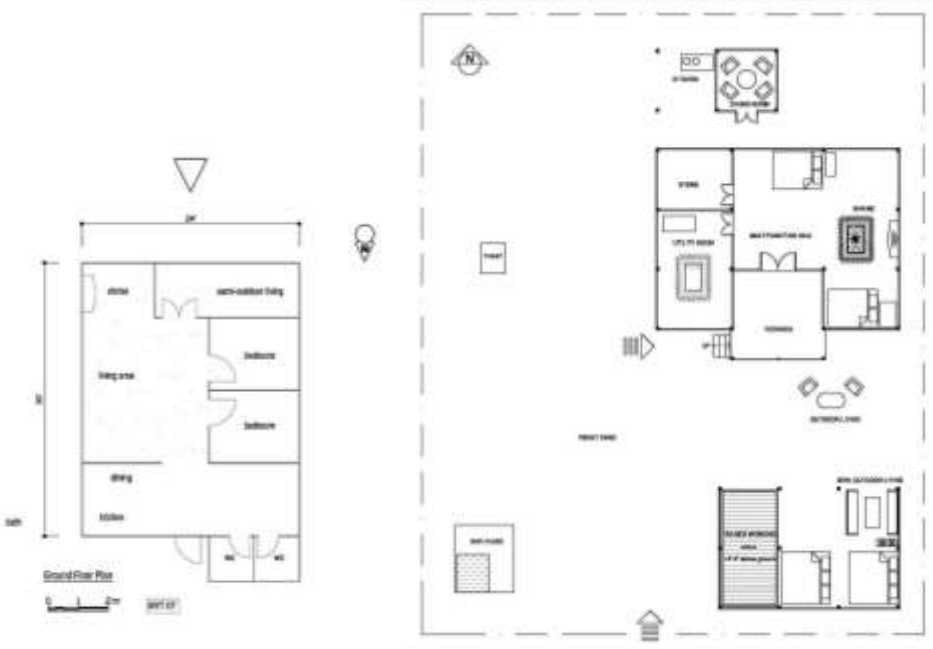

Figure 5.2. The Most Common House Plan (2005 Completion) on the Left and Village Traditional House Plan (1953 Completion) on the Right

5.3.1. Functional Spaces

Living space is in the multifunctional space. Semi-outdoor living is found to be a common identity. Shrine is just an area in the multifunctional space. In the traditional village house, there is only one individual room for sleeping. But it is used as a utility room now. All sleeping areas in use are in multifunctional space.

Dinning and kitchen is attached with the main building in most of the contemporary houses. Bath and toilet are mostly separated from the house if there is a spacious yard and always try to be in the Foot part.

It may be an intermediate point where it is possible to experience the interior and exterior spaces from the same position. A wide and spacious open deck is airy and through which breeze can circulate well. Large openings with awnings are made to allow views into the common elevated timber deck (*Ka Pyin*) and clear flow of ventilation into the rooms. In contemporary traditional houses, this space is transformed into a narrower one, the balcony, making a pleasing connection with its related space. There is a remarkable wide transition area at the entrance including space to take off footwear.

5.3.2. Open floor plan and Level of privacy

Flexibility according to the availability of space becomes a contemporary feature of common people's houses. There is a difference in people's preference in a village and in a town, depending on the different socio-economic backgrounds. Village houses are more of open floor plans. This is a reflection of the kinship and family lifestyle without much need of individual privacy.

Family living area is commonly found just around the guest receiving space and they are using the same common facilities in many of the case studies.

There are semi-outdoor living areas in most of the houses attached to the house under the same roof or separated from the house under a shade. Residents prefer to stay in a cool airy spacious place under the shade. Semi-outdoor living space is very common because of its usefulness as a transition between exterior and interior and also an informal guest receiving place as well. It is actually a comfort space in response to the hot weather of central Myanmar.

5.4. Multifunctional Space in a Typical Single Storey Traditional House

It is a one storey post and beam timber building built in 1990, in I-Gyi Village, Mandalay Region. In the house plan composition, living area is in a semi-outdoor place partially enclosed. Shrine area and sleeping areas are found together in a multifunctional space. The whole space is in the Head part of the house.

Figure 5.3. Ground Floor Plan of U Hnin Oo's House in I-Gyi Village

5.5. Summary

The analysis of space utilization and zoning arrangement in traditional houses with regard to the social and cultural lifestyle of Myanmar people gives a deep understanding of their traditional attitude and way of living. Although traditional habitation seems to remain constant without much change through ages, functional requirements and utilization of spaces have changed a lot. It can be seen clearly that some functional spaces in early traditional houses do not find their places in contemporary house planning when the concept of zones is supposed to be the same. People's attempts for the cultural division and cosmological division of space can still be found in contemporary houses, though they are not followed strictly. Climate responding features like semi-outdoor living and partly open plan composition are always associated with the commoners' houses regardless of time.

There is a significant presence of semi-open floor plan in contemporary houses. The possible reasons behind this are:

1. Limitation of land price and construction cost
2. Importance of airflow and lighting inside
3. A reflection of the kinship and family lifestyle without much need of individual privacy
4. Working family members away from home, causing less household as a consequence of current national economy.

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CHAPTER 6
INTEGRATION OF TRADITIONALARCHITECTURAL IDENTITIES IN CONTEMPORARY MYANMAR HOUSES

6.1. Introduction

The first part of Chapter (6) is to study a contemporary Myanmar house in Yangon designed to house the essence of traditional architecture integrating with it. The analysis is mainly focused on the spatial composition of the whole house to find out which composition of space reflects what kind of space experience. In Section (6.2.1), contemporary house is studied with respect to horizontal space composition and vertical space composition. The study was carried out with the aid of architectural drawings provided by the architects and a verbal interview with them as well.

In the second part, possible integration of traditional architectural identities in future design of houses in central Myanmar is discussed. The recommendations are basic spatial concepts for a Myanmar house including concepts of individual functional spaces such as living area, bed room, shrine area, dinning and kitchen spaces. In Section (6.3.2), concept of spatial composition for integrating with the contemporary houses is recommended based on the analysis from previous chapters. In section (6.3.3), the concept of orientation and adaptation to climate is discussed as an important recommendation. There is an explanation of two types of orientation of the house in the sub-heading (6.3.3.1). In Section (6.3.4), there is another recommendation for integration of intangible qualities in the contemporary designs from architectural aspects. The last section of the chapter is concluded with some general remarks on the integration of traditional identities.

6.2. Traditional Architectural Characters in Contemporary Houses

6.2.1. Case Study of a Contemporary House in Myanmar

The house is designed to house a single family of 2, located at Na-Wa-Day Garden Estate, Yangon, Myanmar. It was self-designed by the architect of Modular Architects, Yangon, who is the owner of it as well. The house is sculpted with simple and clean layouts, with the use of local materials. Being for a Burmese family, design

approach of the house is also trying to reflect Burmese traditional life style and tropical environment of Yangon.

6.2.1.1. Horizontal Space Composition

The approach envisions nature as a force of energy which flows through the interior spaces which is reflected on the floors, walls and ceiling. [Modular Architects: (2015)]

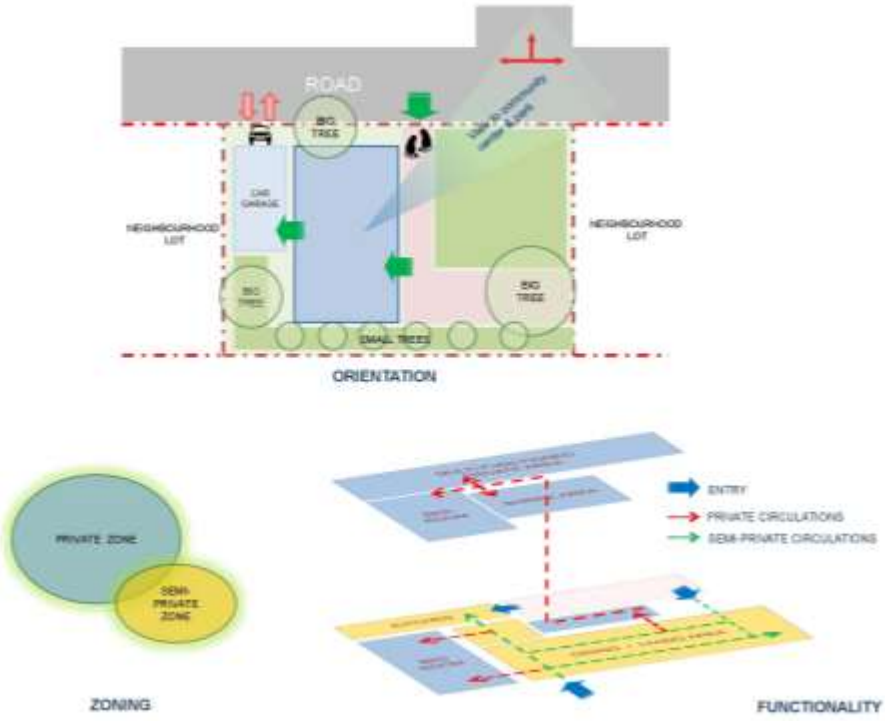

Figure 6.1. Orientation, Zoning and Functional Diagram of Spaces in Case Study House [Modular Architects: (2015)]

Being reflected from a Myanmar traditional house, the spaces of the house are composed with rooms which can have good interrelation to each other.

There is an open friendliness about this house which is a characteristic of the warmer climate of Myanmar. That reflects a life style which is a unique expression of a Burmese family.

Figure 6.2. Ground Floor Plan of Case Study House [Modular Architects: (2015)]

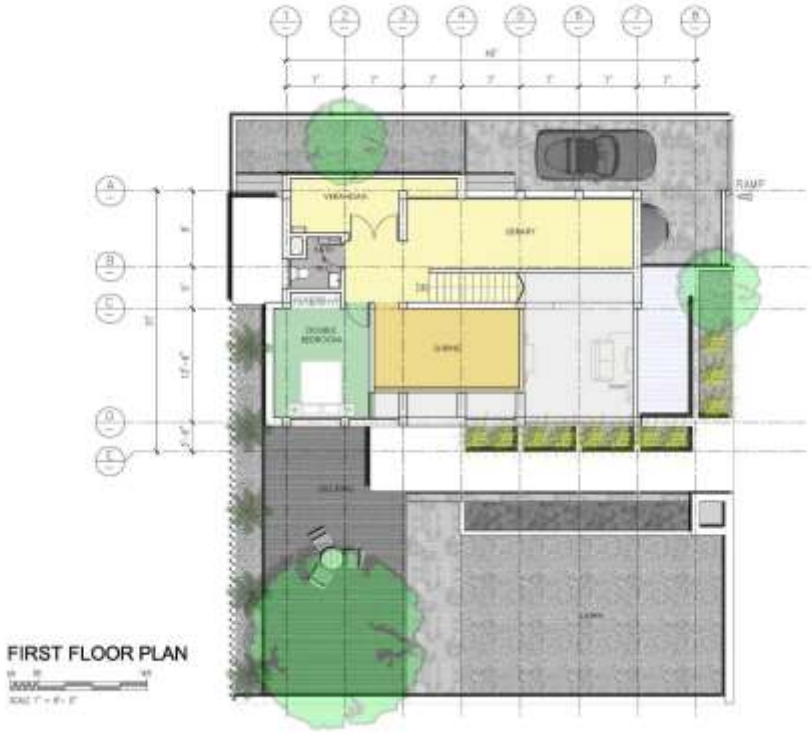

Figure 6.3. First Floor Plan of Case Study House [Modular Architects: (2015)]

6.2.1.2. Vertical Space Composition

The house is also sculpted with exposed frames such as beams and floor voids. The design is trying to translate a traditional framing, with the modern construction materials and methods. Simple plan composition with a multifunctional space is a prominent feature.

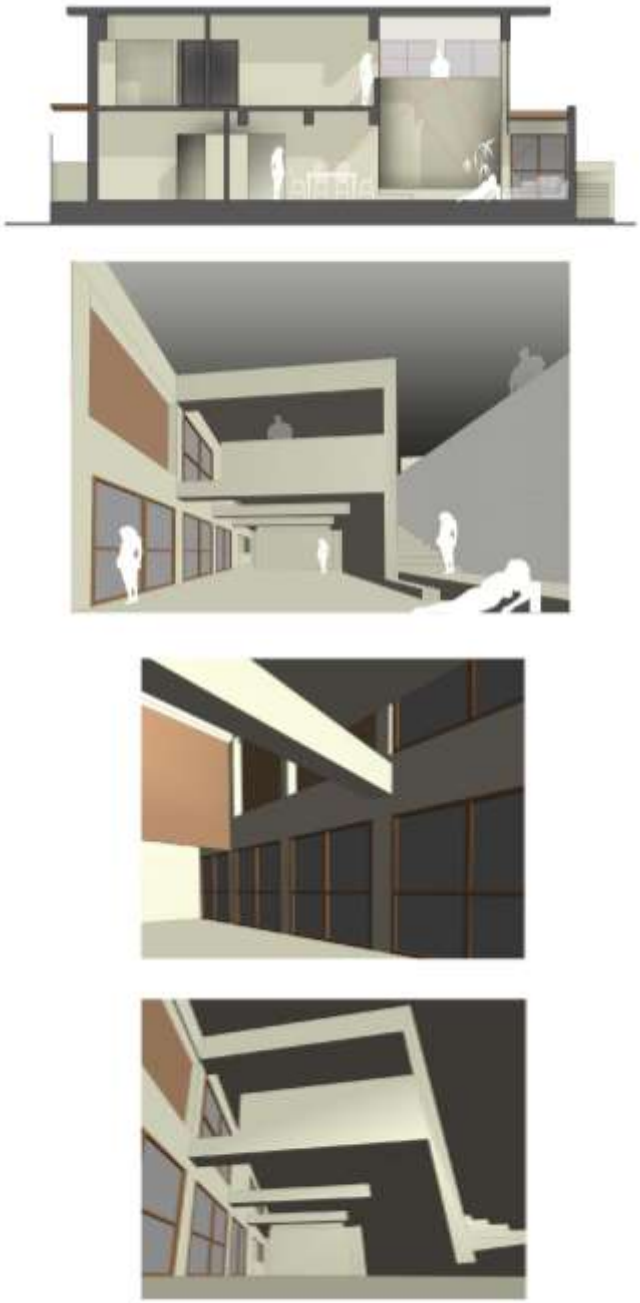

Figure 6.4. Vertical Section and Interior Space Composition of Case Study House [Modular Architects: (2015)]

The ceiling of the living area on ground floor is at the double volume height in order to give the mezzanine effect to the first floor. One can see and communicate between the two floors from the study room in the first floor. The architect explained that it is an attempt to reflect the same layout and atmosphere in a traditional house where all the family members are well communicated through the space composition.

6.3. Recommendations for Integration of Traditional Architectural Identities in Contemporary Houses

6.3.1. Concept of Individual Functional Spaces

Living Space

Location – Semi-outdoor living and outdoor living deck are favourable at the front facade of the house for informal guest receiving as well as family living. Formal guest living is inside the house as a semi-private space.

Furniture – Wooden table and long spacious settee are unique for indoor and semi-outdoor living. In case of outdoor living on a timber or bamboo deck, seating on settee or seating on straw mat directly on the floor are the best options. A wooden shelf is common for earthen pots of drinking water near the living space.

Bed Area

Location –Minimum of bed rooms are in the plan layout. Majority of the inhabitants prefer to sleep on the ground floor than on the upper floor as it is cooler to stay under the upper floor without being directly under the roof. If it is not a two or more storeyed building, bed rooms placed under the mezzanine floor should be considered.

Furniture – Most are raised wooden bed on the ground floor. In case of upper floors, bed over straw mat directly on the floor if it is a wooden floor. Sometimes it may be directly on the bamboo raised floor even at ground floor level.

Bath and Toilet

Location – They are commonly found separated from each other but always in the “Foot” and “Rear” part of the house. Although people prefer to be separated from the main house in the past, most people find it convenient to place them attached to the main house.

Shrine Area

Location – It should be always in the easternmost part and “Head” part, not in the form of an individual room but as a part of multifunctional space. Southernmost part is also a second alternative to be considered. To provide ample amount of flexible space in front of the Buddhist altar is the most important thing in the space planning.

Furniture – An elaborate wooden Buddhist altar for the Buddha statue or just an image on the wall, it depends on the possession and religious depth of the house owner. Here, for the seating, straw mat or carpet directly on the wooden floor is preferable in any occasion.

Dinning and Kitchen

Location – Dinning and kitchen are mostly attached each other usually in the “Rear” and “Foot” part, separated from the main house. For cooking strong odour dishes, an outdoor or semi-outdoor kitchen is favourable near the indoor one.

Furniture – Most dinning settings are with wooden table and chair and some with lower circular wooden table to dine sitting over a straw mat directly on the floor.

6.3.2. Concept of Spatial Composition

The shrine is the most significant space of all that makes the planning of a Myanmar traditional house different from others. The importance of this space is emphasized by changing floor levels or dominating roof form upon it. The elevated floor of early Myanmar traditional houses reflects Myanmar people’s preference to live on a raised level than on a lowered one from both psychological and cosmological aspects. Later, space under the stilted house or raised floor is functionally popular in response to the regional climate. It ensures adequate cross-ventilation, particularly in summer.

Outdoor living space with its overall space composition gives the guests a delightful sensation in terms of sight and comfort. Partitions of small rooms may sometimes obstruct the cross-ventilation in the house. As a consequence, openness of planning with or without vertical dividers came into exist. It also reflects the kinship and family lifestyle without much need of individual privacy. For these reasons, the multifunctional space has become the most common and easily recognized feature of contemporary traditional Myanmar houses.

Giving a more liveable sense of house, there are the effective spaces in relation to the social life style of Myanmar people. Those are the semi-public spaces to provide

privacy for the family. This is the transition space before entering the kitchen and the living area. Neighbours can be received at the transition space and therefore, the indoor living need not to be used too many spaces. It is required to be direct access from bath and washing place to the private zone of the family members.

A post in the traditional concept is regarded as a tree and the word *Pin* which is meaning a tree represents a post. Each span represents a room which is called as *Khann* in Myanmar. The designer of a traditional building first determines how many posts (*Pin*) will be used in construction when the first consideration of plan begins. There have been traditional structural systems and dimensions of the individual members formulated according to this concept. The *Pin* allows the designer to build with an understanding of not only how much material is needed but also how each structural component will be placed together. In this way, traditional architecture has employed a unit of standardisation in planning and construction of residential buildings.

6.3.3. Concept of Orientation and Adaptation to Climate

The vast majority of traditional houses in central Myanmar have no air-conditioning and this situation is likely to remain for many years to come. Therefore, it is necessary to design the houses those have the best conditions and orientation with respect to the prevailing climatic conditions. Heat in this region comes from the sun in the form of light rays. The sun's rays are most difficult to exclude from a building when they are at a low angle, that is, in the morning and the evening when the sun is shining from the east and the west respectively.

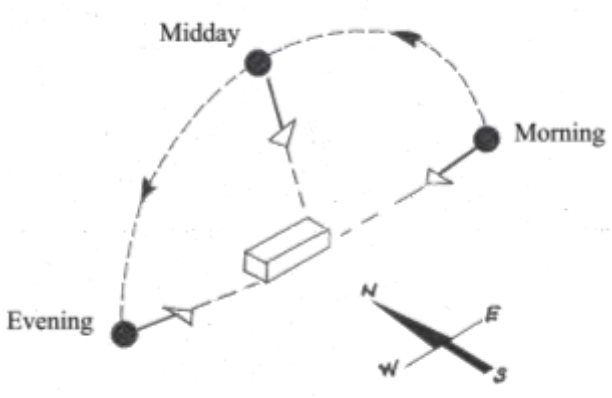

Figure 6.5. The Sun's Path and Orientation of the House in Survey Areas

Two Types of Orientation of the House: *Nay Shout Khaung* and *Nay Kyaw Khaung*

In the confined research region, the orientation of the roofs of most houses is invariably along the east west direction. This type of roof is called as the "*nay shout khaung*" because the ridge is arranged to be orientated along the east west axis, the sun's daily path. The roof with a ridge line not orientated along the sun's path is generally called as the "*nay kyaw khaung*". The reason why the "*nay shout khaung*" roof type is popular is this is the optimum orientation with respect to hot dry nature of regional climate. This is to cut down the amount of sunlight into the main body of the house and at the same time obtain the maximum benefit of the cool winds.

The alignment of the granary (if there is one) is the opposite of that of the house to utilize the optimum sunlight. By setting the longer side of the granary along the north south direction, the paddy or the crops in the granary will get all the sunlight it needs to dry. It has become a tradition in Myanmar traditional building industry and been still practising these days. This tradition partly shapes the site layout of a traditional Myanmar house compound.

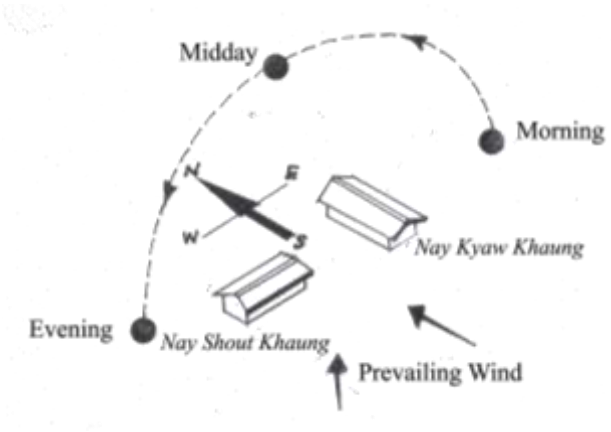

Figure 6.6. Two Types of Orientation of the House with Respect To the Sun's Path

6.3.4. Intangible Qualities from Architectural Aspects

Although there are examples of just adding decorative elements to the house, not until these enrichment and adornment find their way of meaningfully integrating into the traditional spirit, the architecture would have been incomplete. Therefore, not only the tangible but also the intangible qualities are essential things to be analysed. Individual architectural elements of a traditional Myanmar house are analysed from architectural aspects.

A sense of transparency between outdoor and indoor spaces is also generated with use of semi-open interior spaces and through openings in the case of houses with raised floor level. Semi-outdoor living space in the "Front" part itself expresses the hospitality

of Myanmar people in a significant manner. There exists a wooden table, a pair of settee and a shelf for a row of earthen pots of cool drinking water nearby. Together all these things animate the space so defined. This space itself characterizes an expression to give a sense of Myanmar hospitality as well as a sense of place without any vertical enclosures. Similarly, the kitchen is easily accessible by not only all family members but also the intimate guests as well.

In an early traditional Myanmar house, the deck gives a delightful sensation in term of sight and comfort while it also provides the feeling of an intimate space formed by the surrounding blocks, acts as an outdoor living space as well as an exciting transition space between inside and outside, and gives a sense of transparency between interior and the deck itself. A wide and spacious open deck is airy and through which breeze can circulate well. Through ages, the deck becomes smaller in size and at present day, it is evolved in the form of veranda which is directly accessible from a stair outside the house.

6.4. Summary

The great majority of the traditional houses and present-day houses of the common people have a multifunctional space which has been rooted in religious, cultural, climatic and economic backgrounds. Open floor plan and flexibility according to the preference and limited availability of space becomes a contemporary feature of common people's houses.

As long as there is a shrine area in the house, a spacious open space will be needed for special religious occasions. This space will also house other functions as a very friendly and convenient multifunctional space at the same time. Some contemporary houses may have special arrangement of sliding vertical space dividers which can be wisely controlled to create a spacious multifunctional space whenever needed.

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CHAPTER 7
CONCLUSION

People's attempts for the cultural division and cosmological division of space can still be found in contemporary houses, though they are not followed strictly. Majority of the house owners prefer open floor plan, regardless of urban or suburban house, mainly because of climate and family lifestyle.

There is a tendency in lesser significance of the shrine area in some contemporary houses while multifunctional space is the obviously the most important of all habitable spaces.

It is learnt that traditional beliefs and social etiquette strictly govern the spatial planning of an early traditional Myanmar house while space within a contemporary traditional house is primarily structured by practical needs and climatic influence. People's ideas on space usefulness are transforming along with the changing nature of practical values and climate.

This research is conducted with the awareness of different aspects of architecture, introducing novel conceptual approaches not considered before to have access into the pre-existing hallmarks of Myanmar traditional architecture. The evaluation and overall research analysis are carried out based on reasonable and sensible architectural approaches and through consideration of the factors influencing the design of traditional houses.

The continuing vitality of the identities of Myanmar traditional architecture depends clearly on the value system, sensitive assistance and encouragement from Myanmar architects and the continuity of architectural traditions. Old patterns of social relationships and facilities, once mirrored in the house, may change, but the traditional houses of central Myanmar will continue to offer themselves as a symbol of regional and cultural identity.

This thesis can be a stepping stone in developing further studies and researches related to the architectural aspects of traditional Myanmar houses in other regions of Myanmar. This also may be useful as a reference for architects who want to create a contemporary architecture integrating with the characters of traditional architecture,

reflecting the traditional society of central Myanmar and revealing the modern technology and advanced materials.

As a further research, it needs to find out the optimum means to create an architectural product impregnated with the essence of Myanmar traditional architecture, spiritually as well as physically. The integration of traditional architectural identities in new residential buildings in order to manifest the national and cultural identity is the ultimate responsibility of all the architects and authorities in such a globalization era.

APPENDICES

Appendix1. Table 1. General Information

House. No.	Storey	Construction type	Intended household	Completion date	Cost	Builder	Floor Area (LxW)	Approx. sqft	Front Yard (LxW)	Compound (LxW)
01										
02										
03										
04										
05										

Type of Construction	Household Number	Construction cost	Designer & Builder
1. Reinforced Concrete 2. BrickNogging 3. Timber Frame 4. Masonary	1. Upto 3 2. Between 3 - 5 3. Between 5-7 4. Between 7-9 5. More than 9	1. Less than 10 million 2. (10-20) million 3. (20-30) million 4. (30-50) million 5. (50-100) million 6. Over 100 million	1. Owner by themselves 2. Owner & Engineer 3. Owner & Contractor 4. Owner & Architect 5. Architect 6. Engineer

Appendix 2. Table 2. Construction Materials

Sr. No.	Roof Sheet	Roof Frame	Column	Beam	Fence	D/ W	Wall	Wall Finish	1st Floor Finish	1st Floor Finish	1st Floor Ceiling	Stair	2nd Floor	2nd Floor Finish	2nd Floor Ceiling
01															
02															
03															
04															
05															

Structural Members	Finishes (Wall/Floor)	Ceiling	Door / Window	Roofing sheet	Fence
1.R.C* 2.Brick 3.Timber 4.Steel	1.Paint 2.Tiles 3.Unfinished 4.1)Timber PTG .2)Parquet 5.Glue-laminates 6.Carpet 7. Marble	1.Plaster board 2.A.C sheet 3.Plywood 4.Timber 5.Gypsum board 6.Fibre cement board 7.Laminate sheet 8. Paint on plaster	1.Timber & glass* 2.Aluminium & glass 3.Timber& Timber 4.Iron & Timber 5.Iron & Iron 6.Timber & Bamboo 7. UPVC*	1.Colored Zinc 2.CGI* 3.Clay tiles 4.Wood shingles 5.Thatch/Bamboo 6.R.C slab	1.Brick & Iron 2.Iron 3. Brick & R.C 4.Bamboo 5.Timber

Abbreviations * :

Timber & Glass – Timber door frame & Glass windowpane

UPVC - Unplasticized Polyvinyl Chloride

CGI- Corrugated Galvanized Iron

R.C- Reinforced Concrete

Appendix 3. Questionnaires on other general information

Number of household currently staying

Male: Female Ratio

*Occupation of the main person (Head) of household/ the main business of the family

Occupation of other household members

*Monthly income of the whole family

Complying with local land use regulation (Y/N)

Mechanical means of thermal comfort (Y/N)

Climate response structure (Y/N)

Decorative details (Y/N) , (If YES, which kind of materials?)

Distinctive features (by Architecture/ Culture/ Climatic) ?

* While asking about questions about monthly income of the whole family and the way the main person (Head) of household earn the living or the main business of the family, there were perceived sensitivity in some people. It was a bit difficult to make them understand the need for the question by explaining the nature of the research that is only for academic research purpose. Therefore, there were some instances where monthly income of the family was decided upon the assessment of the general information and other indirectly related questions.

Appendix 4. Table 3. Daily Activities Timetable of the Household (in the case of a 1 storeyed House)

Place / Time	Living	Multi-purpose	Shrine	Bed (1F)	Space under house	Kitchen	Dining	Balcony	Outdoor living	Front Yard
5:00-7:00										
7:00-9:00										
9:00-11:00										
11:00-13:00										
13:00-15:00										
15:00-17:00										
17:00-19:00										
19:00-21:00										
21:00-23:00										
23:00-1:00										
1:00-3:00										
3:00-5:00										

Appendix 5. Table 4. Daily Activities Timetable of the Household (in the case of a 2 storeyed House)

Place / Time	Living	Multi purpose area	Shrine	Bed (1F)	Bed (2F)	Kitchen	Dining	Balcony	Outdoor living	Front Yard
5:00-7:00										
7:00-9:00										
9:00-11:00										
11:00-13:00										
13:00-15:00										
15:00-17:00										
17:00-19:00										
19:00-21:00										
21:00-23:00										
23:00-1:00										
1:00-3:00										
3:00-5:00										

Appendix 6. Table 5. Daily Activities Timetable of the Household (in the case of a 3 storeyed House)

Place / Time	Living	Multi-purpose	Shrine	Bed (1F)	Bed (2F)	Bed (3F)	Kitchen	Dining	Balcony	Outdoor living	Front Yard
5:00-7:00											
7:00-9:00											
9:00-11:00											
11:00-13:00											
13:00-15:00											
15:00-17:00											
17:00-19:00											
19:00-21:00											
21:00-23:00											
23:00-1:00											
1:00-3:00											
3:00-5:00											