

**Social Change and the Thai House:  
A Study of Transformation in the Traditional Dwelling of Central Thailand**

by

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To  
Mother and Father

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# **Abstract**

## **Social Change and the Thai House: A Study of Transformation in the Traditional Dwelling of Central Thailand**

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The traditional farmhouse of Central Thailand is a distinct form of vernacular architecture. Major design features include large, multi-level, open-air platforms built on stilts, with smaller enclosed living compartments constructed of modular panels, and having a high peaked roof. This design evolved to meet the needs of subsistence farmers for whom home was integral to agricultural production. In recent decades Thailand's farming communities have seen increased agricultural productivity, increased wealth, and smaller families. This dissertation investigates the impact of this social transition upon the traditional farmhouse of rural Central Thailand in terms of the three domains of Place Experience: 1) conceptual meaning, 2) activities, and 3) physical attributes.

The study design is a single-case study with mixed methods including survey of temple murals and archival records, floor plan reconstructions for historic homes, interview of house occupants and builders, Space Syntax analysis, artifactual documentation for contemporary homes, and direct observation of occupants' behavior.



Results show a changing Place Experience. For example: 1) the use of multi-level platforms had symbolic meaning in historic house design, but in contemporary houses a single level platform is considered more practical; 2) interviewees reported having more leisure time and concerns about preserving their homes that influenced decisions to make modifications; and 3) building shells have become more enclosed with permanent walls and roofs to protect valuable hardwood and increase security. Interpretation of these results suggests a framework of underlying principles that can be divided into dichotomies for comparison of historic to contemporary design as: hierarchal/integrative, dynamic/flexible, collective/individual, and outward/inward.

This dissertation serves two complementary purposes. It contributes to the scholarly research on contemporary farmhouse design in Central Thailand by showing how this form of vernacular architecture reflects the changing needs of families where the home has severed its links to community and agriculture to become a “sanctuary.” For applied research, suggestions for design implementation are offered for both housing design in rural areas of Central Thailand, as well as the use of an evolving dynamic model of vernacular architecture as tool for design education.

# Chapter One

## Introduction

The traditional house of farmers from the Central Region of Thailand presents a distinctive form. The most noticeable features are that it's built on stilts with multi-level platforms and a high peaked roof. Another important but less obvious feature is its construction out of modular panels. Overall these characteristics give the house a lightness of form that is quite pleasing aesthetically. Perhaps not immediately apparent are the practical needs served by these features; even though such needs are the major force that has shaped its form.

The farmers' houses of Central Thailand are an example of vernacular architecture. With this form of architecture the house is designed by an amateur whose design emphasizes local needs, and its construction typically uses locally available materials (Brunskill, 2000). Given this emphasis, buildings constructed in this form tend to evolve over time to reflect changes in the environment, the economy, or the culture that impact local needs. Indeed, comparisons of traditional and contemporary houses belonging to the Central Thailand farmers' reveals that changes in design have occurred.

Vernacular architecture is an attractive research subject for many scholars and designers not only in relation to its aesthetic value, but also for those who are interested in the question of everyday life (de Certeau, 1974). As Gillian Darley (1940- ) notes,

*“Vernacular buildings are not the sentimental, picturesque backdrop to real life. They may be beautiful, but that is beside the point. They have emerged out of hard necessities, hard work and hard lives. Their appeal lies in the sense they make.”*

Darley's note makes a good starting point for approaching the vernacular architecture of farmers' of Central Thailand. Research presented in this study seeks to understand how people and communities in Central Thailand utilize traditional technologies to alter their immediate environment to make it their own, and how farmers' houses evolve in response to economic, social and environmental changes. For instance, in traditional house design the use of modular panels made house floor plans easily reconfigurable and particularly well suited to lifecycle changes in the composition and structure of a family. Whereas, in recent decades, house design has undergone transformational changes, including decreased use of modular panels, which challenge at least some of its traditional uses. These observations quickly lead to several interesting questions about why the house form is this way and what factors have influenced such changes.

This study addresses questions aimed at both scholarly research and applied research. For scholarly purposes, an understanding of such processes will enable the architectural research scholar to understand the role of the vernacular house design in relation to changing lifestyles in a social context. It will lead to the insight into how the vernacular building is designed to meet specific needs, accommodating the values, economies and ways of life of the cultures that produce them.

For applied research purposes, we discuss factors influencing design application in Thailand as well as other problems in design education. In terms of design application purpose, recognition of the vernacular building as an evolving process and how people shape their habitant to meet their specific needs can also be used as a model for designers to learn from as a remedy for the lack of understanding between designers and the client's needs. Finally, this study reports on design implications, as learned through the transformation of vernacular houses, that may possibly be incorporated into the modern housing design in the rural area of Central Thailand.

### ***The vanishing traditional Thai house***

This section provides the justification for investigation of traditional vernacular house design in Central Thailand. Vernacular architecture is described by Gombrich (2005) as the "greatest creation of mankind." While clearly hyperbolic, Gombrich's

statement is apt for urging the importance of making a record of such architecture in a rapidly industrializing world. Although his remarks refer specifically to European cultural history, the same value may reasonably be applied to the vernacular tradition of Thailand.

The rapidly changing economy in Thailand has produced social and cultural transformations that have had a major influence upon both the lifestyle of farmers and the design of their homes. Technological advances in agriculture have increased the profitability of farms. While increased mobility of labor has produced additional streams of income as the younger generation migrates from rural areas into cities to pursue better paying jobs. Together these changes have resulted in improved socio-economic status coupled with demographic changes in family structure. These transformations also had a clear impact upon the design of the traditional Thai home. Most traditional Thai homes have either been modified or replaced completely.



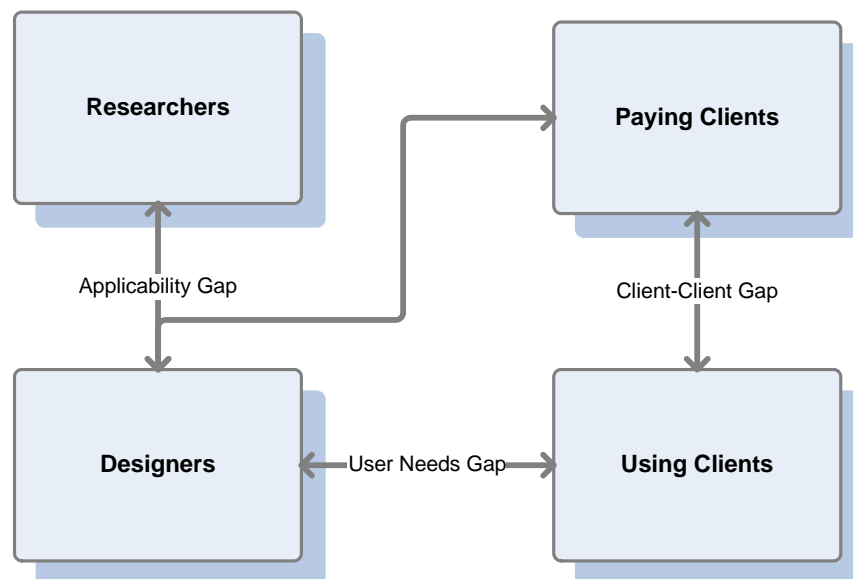
**Figure 1: One of the increasing numbers of unoccupied houses in Central Thailand**

Some traditional Thai homes that once belonged to farmers have either been sold to antique collectors to be modified and resold to the affluent city dwellers or left abandoned and dilapidated awaiting replacement by modern design housing projects.

Remnants of the traditional Thai home can nevertheless still be found in more remote agricultural areas. However, traditional architecture is fading away along with the lifestyle it once supported. The relationship between house form and culture is inseparable. As Rapoport (1969) notes “house form is not simply the result of physical forces or any single causal factor, but it is the consequence of a whole range of socio-cultural factors seen in their broadest terms.” Vernacular architecture is valuable, not only as a repository of historical and cultural information, but also as a model that shows how the built setting has been adapted to respond to the needs of its occupants through changes in both the social, economic and the physical environment. Through the study of vernacular architecture, we can gain insight into how architecture interacts with cultural and environmental change (Rubbo, 1979).

### ***Widening “design gaps” and the “cultural invasion”***

The “design gap” problem and the effects of “cultural invasion” are considered the twin predicaments that make the study of vernacular architecture worthwhile. These two problems are intertwined and must be simultaneously discussed.



**Figure 2: Gaps in design process**  
[Adapted from Bell ( 2006)]

These widening gaps contribute to the incongruence between architectural design and fulfillment of the needs of stakeholders. Bell and colleagues (2006) identify gaps between four groups of stakeholders involved in the design process, namely the designer, the researcher, the developer, and the using clients have widened significantly as many societies shifted from an essentially agricultural economic system to more industry oriented systems.

In Thailand, design gaps first originated from two sources. As the parties involved in the construction process changed with the advent of new construction techniques, and as changes in the formal design education system evolved, design gaps increased in scope and magnitude. Prior to the 1930s, neither an architect nor a developer played any part in the construction of the houses of regular people. Instead, houses were built in the traditional vernacular style through a close collaboration between the craftsman and its future occupants. These local craftsmen were actually farmers that doubled as builders when required. They learned the meticulous technique and sophisticated wisdom associated with the construction of indigenous architecture, which had been passed down through generations via the slow process of a master-apprentice learning system (Pongmethakul, 2002)

In earlier periods such as the Sukhothai and the Ayuthaya, the training of craftsman presumably occurred through a master and apprentice system. Professional architects, in the western sense, started to become more influential in Thai society between the reign of King Rama V (Chulalongkorn), in 1868, and the end of the reign of the King Rama VII (Prajadhipok) in the early 1930s. Among the aristocrats who considered themselves trendsetters, European designs were considered highly fashionable. These architects, foreigners who were exclusively from European countries, were hired by aristocratic and royal families to design their palaces and mansions.

In the late 1930's, with the founding of Thailand's first school of architecture on a western model, the influence of European design became firmly rooted. The present pedagogical model in Thailand's design schools derives from the European system. This at least in part explains why formal design education in Thailand emphasizes what O'Brien (2004) described as Eurocentric design. At present, the curriculums for formal design education in Thai design schools provide little coursework on vernacular architecture. As

a consequence, such knowledge and its application are treated as nearly irrelevant by Thai architects.



**Figure 3: Examples of Eurocentric house designs found in housing developments for upper income brackets**  
[Source: Various advertisements for housing developments]

Another factor contributing to the widening gap between designers and clients is the culture of design schools themselves (Groat, 2000). The formal education in design schools not only trains the novice to become an experienced designer, but also works as a mechanism in which architectural tradition and group identity are acculturated. Groat notes that, as graduation from design school nears, not only the students' perception of architectural types are transformed by a finer sense of design acquired through intensive training, but also, their personal goals often shift from a desire provide a useful design service to an ambition to create magnificent building designs.

The same could be said for designers in Thailand as they find high architecture preferable to the conformist vernacular model. Likewise, the need to create the built environment to support the needs of lower class clients is often considered as subservient

to the need for expressing design aesthetic and the return on investment for the developers.

With modernization the client needs are also changing and clients are demanding new types of housing. This partly explains changes in house design, but other forces are also at play. For almost 80 years, architectural study in Thailand has broken away from its local tradition of how to build a house with reference to the connections to the social group it contains, in favor of the transplanted Eurocentric architecture. The imposition of outside culture upon local values and norms is prevalent throughout the developing world, is referred to by Freire (2004) as cultural invasion, or by Kelbaugh (2004) as ‘global trumps local.’

However, it should be noted that the purpose of my argument is not to say that the traditional design is qualitatively superior to Eurocentric design, but is instead to highlight the lack of awareness that contemporary house design as a built setting should be an expression of ideas and sentiments in which it is rooted. This situation has contributed to the broadening gap between designers and clients. The pervasive materialistic mode of western architecture should not be seen as a replacement for the humanistic wisdom and knowledge of vernacular architecture (Rubbo, 1979), but rather the knowledge of the two should be codified and used to better educate the new generation of architects, referred to by Groat (2000) as the ‘cultivators.’ The understanding of the domestic lives in the traditional Thai home will be used as a knowledge base relating to the Thai vernacular architecture that being taught in the educational system to help narrowing the design gap problem.

### ***The system of vernacular architecture study in Thailand***

Traditional knowledge is being lost through inadequate discourse. This loss has taken a double blow; first knowledge has been traditionally kept secret within a master apprentice system and second from the lack of integration of the study of vernacular architecture into the formal architecture educational system. As a result, the state of research and study for vernacular architecture in Thailand has remained dormant for the most part.



In the past three decades, only a handful of researchers have been recognized for their work on Thai vernacular architecture (Chaichongrak, 1979, 1996; Chaichongrak et al., 2002; Chulasai, 1997; Kalayanamitra, 1996; Panin, 1998-1999; Peranonda, 1982; Charernsupkul, 1978). This body of research is comprised mainly of descriptive studies that provide useful background information and a meticulous compilation of architectonic details. A limitation of this body of research is its treatment of the subject as a museum piece or an unchanging static symbol of culture. It's seen as something that must be preserved in its pristine condition while modifications are perceived as an undesirable blemish to the original vernacular form of the dwelling. Vernacular architecture in Thailand tends to be perceived as an artifact of the country's cultural heritage.

Investigation of the socio-cultural aspects of the Thai vernacular house is limited to only a few studies (Chantavilasvong, 1987; Charernsupkul, 1978; Karnchanaporn, 2002; Yimsrual, 2007). For anthropological studies there are even fewer with only a couple studies which address the daily life and ritualistic aspects of the local culture (Sparkes, 2005; Tambiah, 1976). As the relationships between built setting and its occupants are inseparable; the vernacular house cannot be examined as an artifact but as a setting in the context of real life occurring within it. As such, systematic research on vernacular architecture linking the built setting and the day-to-day context or "ethnoarchitectural" research is required.

### ***Vernacular architecture as a model for learning***

An analogy may be drawn between transformation in Thai vernacular architecture and evolutionary biology. In living organisms the unending and elegant process of variation and selection continually reshapes the characteristics of a species. Similarly, vernacular architecture slowly adapts with time to best suit changes in the geographical and socio-cultural environment. This analogy highlights the limitation of viewing the form and features of the vernacular house as a static construct.

While there may be enormous variation in the modification of traditional dwellings, one might expect that efficient features would be retained and replicated in other buildings, while less suitable features are discarded. By simultaneously studying the transformation of vernacular house design along with social-cultural change, we can

both describe the pattern of change and learn about factors contributing to those changes. In doing so, we may identify how specific social-cultural factors influence vernacular house design.

Scientists and engineers sometimes use Biomimicry to imitate nature in order to create efficient designs; the same can be said with modern designers and the transformation of the vernacular houses. We can borrow the ideas that worked and have been preserved, avoid the mistakes that had been made, and finally use this information to improve the design of contemporary housing in ways that fits both the physical needs and the socio-cultural needs of built environments. Learning from vernacular architecture enables us to become sensitive to the phenomena (be they cultural, historical, geographical, climatic, or technological) that shape such architecture and suit the needs of the people it serves.

### ***Research questions***

The built environment is an abstract concept used to describe any product of human building activity. In the broadest sense, it refers to any alteration of the natural environment by human means (Baker, 2002). Still, we know very little about the process of alteration by which the design of a building is influenced by the physical and socio-cultural needs of its occupants. This is because the traditions of architectural studies of vernacular architecture have privileged the search for the meaning of the built setting, and perceived it as an 'end' product, over the processes that produce it in the first place.

However, I argue that the process that shapes vernacular architecture is ever changing, and that vernacular architecture is an evolving form. We can learn about how a society produces forms and these forms reproduce society. One can investigate the kinds of roles the relevant historical processes and social institutions play in generating the built environment (Lawrence, 1990) by embracing the contemporaneous changes that occur to the vernacular architecture, and investigating the process of alteration which is the essential mechanism from which such an ingenious built environment has emerged.

Thus, the research question directing this inquiry is: **“How has place experience including the physical characteristics of the traditional houses in the region of**

## **Central Thailand been transformed in response to a changing socio-cultural environment?”**

The sub-questions to be investigated explore whether there have been any changes in each of the intersecting realms of “Place Experience” (Canter, 1997) which include the physical locale, the activities which occur in each locale, and the conceptual meaning of people in that particular locale. Based on this framework, the subsets of the overarching inquiry to be investigated in this study entail:

- **How have the farmer’s spatial behavior and activities with the house been transformed in the past 50 years?**
- **How have the family and cultural values and experienced meaning of the farmers been transformed in the past 50 years?**
- **How might the physical characteristics of the house been transformed in response to such a changing environment?**

This study recognizes the dialectical relationship between architecture and culture. It acknowledges that production of the built form is rooted in the historical, and shaped by social forces. The expression of social relations, cultural patterns and the symbolic use of space, as well as the adaptation to climatic, geographical, and technological conditions shape building form and in turn user experience. Thus, this study is designed to investigate the relationship between the physical attributes of the vernacular buildings and changes.

### ***Research goals***

This study is driven by two intersecting purposes—the scholarly and the applied for design applications. For the scholarly aspect, it aims at documenting and understanding the dynamic between the physical characteristics of the vernacular architecture, the evolving needs of its inhabitant, and the external factors from the broader socio-cultural environment to which it belongs. For the applied purpose, the insight into how the occupants have modified their home in responses to changes in the socio-cultural context can be used to inform both the researcher and designer of the motivation, the needs, and what is perceived as meaningful features in a person’s home.

In addition, the information in study will be used as a basis for comparing with the domestic life of urban dwellers who migrated from rural areas in Central Thailand, which may be conducted in a following phases. By comparing the spatial arrangement and the form of alteration in both contexts, the author hopes to observe the continuity or the separation of place experience from the rural to the urban context in a future project.

### ***Definition of terms***

The term ‘traditional house,’ in this study, refers to the vernacular Thai houses that can be found throughout the Central region or the heartland of Thailand, which spreads over 26 provinces in the broad alluvial plain of the Chao Phraya River. The traditional house in Central Thailand shares in common with the rest of Southeast Asian dwellings the distinctive architectural style of being a house on stilts with a steep gable roof.



**Figure 4: A characteristic single house in the traditional (historic) Thai style of the Central region [Source Buffalo Museum pamphlet]**

The distinctive characteristics of the traditional Thai house have been described by Chaichongrak and colleagues (2002) as follows:

- “ 1.) Stilts and the typical space underneath the house for domestic activities as well as for storing the Kwien (cart), and during the flood season for mooring boats;*
- 2.) Extended bay unit (hwang), from one to six bays or more, and then doubling-up on the end elevation;*
- 3.) High gable ends to provide rooms with height for heat convection and long projecting eaves to protect the house from heavy tropical downpours;*
- 4.) Diaphragm walls which slopes inwards on all sides along with the structural member, permeable walls and floors for ventilation, especially in the kitchen;*
- 5.) A large veranda/terrace or chan-baan, parts of which are under cover, averaging 60 per cent of the total floor area. ”*

Though sharing these common architectural characteristics with other vernacular houses found in other regions of the country, the Central Thai houses possess distinctive features such as the height of the platform, the pitch of the roof, and the floor plan. A detailed discussion of the architectural style and elements of the house will be presented in Chapter Three: “The review of the architectural studies of the traditional Thai houses.”

### **Scope of the study**

Comparison of the architectural characteristics of ‘historic’ and ‘modified’ homes provides a means toward understanding how the overall quality of place experience in the traditional Thai house has been transformed in response to changes in the social environment. For this analysis the term ‘historic’ denotes the older traditional Thai home, with the age ranges from 68 to over 130 years, of the Central Thai farmers, whereas ‘modified’ refers to those houses that have been adapted from their original ‘historic’ form by its occupants.

An analysis of the physical attributes of house design, which is a component of place experience, is framed by the concept of ‘genotype’ and ‘phenotype,’ which is a set of analogies that Hillier and Hanson (1984) draw from the field of Biology to describe the transformational characteristics of the spatial organization and the physical form of the dwellings.’ In Biology, the term ‘genotype’ refers to the basic constitution of a cell of an organism usually implies a measurement of how an individual differs or is specialized within a group of individuals or a species. In the architectural sense, ‘genotype’ is equivalent to the ‘spatial code’ or compositional characteristic of various spatial

categories within the buildings. How these spaces are connected together will impact the type of social encounters and the quality of experience among the inhabitants.

On the other hand, an organism's 'phenotype' is all of its observable characteristics, which are influenced both by its genotype and by the environment. Just as with the built settings, it is possible that the organisms may have a similar appearance, or 'phenotypes', but could be made up of completely different genetic codes, or 'genotypes'. As such, throughout this study the framework of 'genotype-phenotype' has been used to describe and compare the commonalities and differences of the houses' inherent pattern of spatial organization and more observable aspects of the overall appearance and architectonic details.

Two types of traditional Thai house of the Central region; these are the '*ruen krueng pook*' and '*ruen krueng sab*.'<sup>1</sup> The '*ruen krueng pook*' refers to a relatively flimsy house structure that employs flexible tie-joints of wicker lathes to hold the structure together. The whole dwelling is made up of less permanent material such as bamboo with the vetiver grass or palm leaves roofing (Figure 5).

Because of the nature of a less permanent material used in the construction of the dwelling, the bamboo house is not durable, but easy and quick to build. This type of house is often regarded as an alternative for the poor. It is the farmers' preferred choice when they can afford it is the more sophisticated and stable hardwood home or '*ruen krueng sab*' (Figure 6).

The investigation of this study is focused on the hardwood houses, or the '*ruen krueng sab*.' Some of the hardwood homes, if well maintained, may last over two centuries, and could be occupied by several generations of farmers. In such houses, any physical trace of the symbolism and modification constructed, through the life of the house, are more likely to be preserved in the more durable structure of these hardwood houses than could be expected for the bamboo homes.

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<sup>1</sup> '*Ruen krueng pook*' and '*ruen krueng sab*' can be literally translated as 'the house with tying mechanism,' and 'the house with interlocking mechanism' respectively. The word '*ruen*' means a house or a living compartment, and '*krueng*' means a mechanism. The word '*pook*' means to tie, while '*sab*' means to interlock. In the constructing bamboo houses, the strong bamboo rope is used as a principal mechanism for holding the structure together. The hardwood home is assembled through the used of wood joinery which require a higher level of carpentry skill. Hence the name '*Ruen krueng pook*' and '*ruen krueng sab*.'



**Figure 5: The Central Thai bamboo house or 'ruen krueng pook'**



**Figure 6: The Central Thai hardwood house or 'ruen krueng sab'**  
[Source: Peranonda (1982) ]

To gain insight into the complex interaction between the physical attributes of the home and the socio-cultural phenomenon that constitute place experience in an exploratory study such as this one, it would be more appropriate to limit the investigation to one type of setting—the farmer’s house.

### ***Organization of the dissertation***

Following this introductory chapter, the dissertation is divided into three major sections. The first section encompasses a review of the literature pertinent to social changes and the transformation of the traditional house form in Thailand including reviews of the socio-cultural context (Chapter Two), architecture (Chapter Three), and anthropological studies (Chapter Four). The second section comprises of the review of theoretical framework influencing this study (Chapter Five) and provides the research design for the dissertation (Chapter Six). The final or the third part includes the findings (Chapters Seven through Ten) and the concluding chapter (Chapter Eleven) which also provides some design recommendations. A detailed overview of each chapter is as follows:

**Chapter One** introduces and lays out the relevant context for the study, and provides the justification for using vernacular architecture as a model for learning. Also included in this chapter are the research question and goal, definitions for terms used, theoretical frameworks, and the scope of study.

**Chapter Two** examines how the Thai government’s post World War II’s policies and development of agricultural programs in Thailand have led to transformation of the lifestyle and social and cultural values of the Central Thai farmers. The impact of changes in rice production and changes in governmental programs to the Baan Krang’s farmers’ daily lives, family structure, and their way of thinking are reviewed. The objective of the review is to gain an understanding of what changes in the social context influence transformation of the house form.

**Chapter Three** focuses on the architectural studies of the traditional Thai houses including the research design approach used in the studies. It traces the historical development of research on the Central Thai house, an overview of both the physical attributes, and the socio-cultural aspects relating to the traditional Thai home in general.



**Chapter Four** reviews the anthropological studies on the traditional Thai houses. It aims to explore the general characteristics of the cultural aspects of the domestic life of Central Thai farmers. The topics discussed in this chapter focus on the ritualistic aspects of domestic life such as the house building ceremony, kinship, gender roles and religious practices as well as how might these conceptual meanings have changed in the past 50 years.

**Chapter Five** reviews general theoretical influence on the study of the transformation of place experience in the traditional Thai home from perspectives that are psychological, anthropological, and historical. It also compares and contrast the two theoretical frameworks of “Place Experience” (Canter, 1979) and “Space Syntax” (Hillier and Hanson, 1984); which stem from the ‘Structuralist’ tradition and will used as a basis for the research design and interpretation of the data in this study.

**Chapter Six** presents a research design strategies of ‘A Single Case Study with Mixed Methods.’ Various methods, such as naturalistic observation, interviews, artifactual documentation, archival records, survey of the mural paintings and museum house used in this study are discussed. Criteria and description of the case, site, and interview samples are also included.

**Chapter Seven** presents findings and discusses the social and cultural values of the Central Thai farmers that have been transformed or remained unchanged—in relation to the impact of the social changes reviewed in Chapter Three.

**Chapter Eight** describes the physical aspects of the contemporary Central Thai farmhouse by concentrating on the “phenotype” or the enclosure and its architectonic details. Comparison between the overall physical attributes of the historic home and the contemporary are also provided.

**Chapter Nine** presents analyses of spatial organization and compares and contrasts the design of interiors spaces within the contemporary and historic homes by using the Space Syntax method along with other qualitative information.

**Chapter Ten** discusses the underlying principles of house form transformation pertaining to the overarching inquiry for this research. It presents and analyzes the transformation of the interior space of the house enclosure as well as the community settlement structure.

**Chapter Eleven** is the concluding Chapter. Its objective is to summarize the transformation of experiential aspects of the traditional home, and underscores the dialectical relationship between the built setting and social factors. This chapter offers suggestions about ways in which vernacular architecture may be perceived, and shows that vernacular architecture can be taught using evolving models.

## **Chapter Two**

### **Review of socio-cultural change and its impact on the lives of the Central Thai farmers**

Place experience consists of physical locale, local activities, and the meaning people assigned to such locale (Canter, 1997). To understand the dynamic among the three, and how they interact, we need to examine each more closely. As we need to understand the transformation of the place experience and the physical attribute of the houses, we are required to explore changes in the social milieu that influence the daily life, livelihood, and well-being of Thai farmers in the Central region. This chapter is about such issues.

This chapter introduces a brief history of rice production in Thailand from the late 1950's to present. It explores the impact of mechanized rice production, the introduction of new rice varieties, the government agricultural development programs, and how they have contributed to the socioeconomic condition, the migration of the rural population, and the changing family structure, which lead to transformation of the lifestyle of the Thai farmers.

#### ***The past and present of rice production in Thailand***

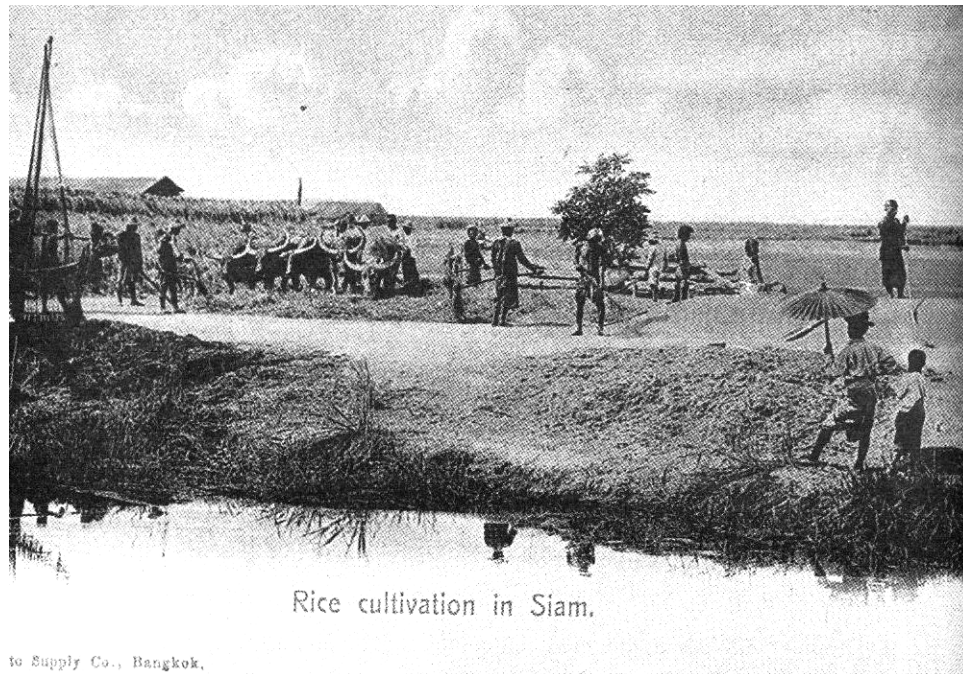
In Thailand, rice is of such importance that the country is often called “a rice-growing society” or “a land of rice.” Rice growing has been the economic engine that has sustained the development of Thailand since as early as the 13th century (Feeny, 1982). Traditionally most rice grown in Thailand has come from native varieties that limit production to a single crop per year. While the dry land glutinous rice is grown in the North, the wetland non-glutinous rice dominates the Central Plain. From 1800-1950,

the major rice growing areas have been the dry land Chiangmai Valley in the North, and the wetland, delta areas of Central Plain.



**Figure 7: Rice growing was extremely labor intensive before the introduction of mechanized production**  
[Source: Nawikamune (2001)]

After the Second World War, Thailand became the world's largest rice exporter, when Myanmar, the leading rice producer at the time, was ravaged by war. World Bank records, from 1958, show that rice growing occupied more than 70 percent of Thailand's cultivated land, and accounted for 40 percent of the total value of agricultural output (*Income Growth and Poverty Alleviation*, 1980). During this time, two-thirds of the entire Thai population earned its living from rice farming.



**Figure 8: Rice cultivation in Thailand circa 1920s**  
[Source: Nawikamune (2001)]

In rural areas of the 1950s, rice sales contributed about 40 percent of total farm cash income (Akiyama, 2004). Shigetomi (2004) noted that rice farming during this time was dominated by smallholders, and most of the crop was consumed by its producers while only small surplus was occasionally sold in the local marketplace.

The transition from subsistence farming to intensive rice production began in the 1960's. It was also the beginning of the deployment of the very first National Social and Economic Development Plan (1961-1963). The government had begun to enact policies to assist agricultural development such as the "Ditches and Dykes Program (1962)," and then the "Land Consolidation Act (1974)," which contributed to increased rice production especially in the Central region. The impact of this policy and land reform related issues will be discussed in the following section.

In 1969, new varieties of non-seasonal rice that allowed multiple crops per year were introduced to Thailand (Isvilanonda, 2000). These non-seasonal rice varieties led to the intensive rice cropping, and the expansion of farm holdings, as well create double rice cropping particularly in wetland growing areas.

The following decade of the 1970s was the "golden age" of Thai agriculture. The farmers reaped the benefit from the steady expansion of the infrastructure created by the

government that begun in the 1960s. Much of the impressive economic growth during this time was also attributable to the substantial surpluses of commodities for export produced by the agricultural sector coupled with a significant price increase in agricultural product brought out by the global commodity (Krongkaew, 1985). With increasing capital gain, and the benefit of government irrigation system, the farmers were able to expand landholding, away from the natural water source, to increase the crop output.

By the early 1980s, most of the arable land in the Central area had been occupied, and continued growth of the agricultural sector became increasingly dependent on the acceptance of new technologies and the adoption of more intensive cultivation (Feeny, 1982; Krongkaew, 1985; Duangwiset, 1996; LePoer, 1987).

The cropping intensity, which was 69 percent during the implementation of the first of the Thai National Economic and Social Development Plan (1961-1963), rose to 81 percent in the third plan (1972-1975), which was quite high according to the national standard. By the mid-1980s, agriculture accounted for an average of about 25 percent of GDP, and agricultural commodities accounted annually for over 60 percent of the value of all exports (Krongkaew, 1985).

In the 1990s, croplands including the irrigated paddy rice covered more than 56 percent of the country's arable land. Most of the smallholders of rice paddy, in the Central area were well off enough to increase the productivity with the mechanized operations, and intensive inputs such as fertilizers and pesticides (Wattanuchariya, 1992-2001). Isvilanonda and colleagues (2000) observed that the impact of increasing labor price, and the changing agricultural system, had led to the increased efficiency in rice production during the 1990s. With the aid of modern machinery labor working days per unit of farmland (rai) was reduce from an average of 9.3 to 3.8 working days.

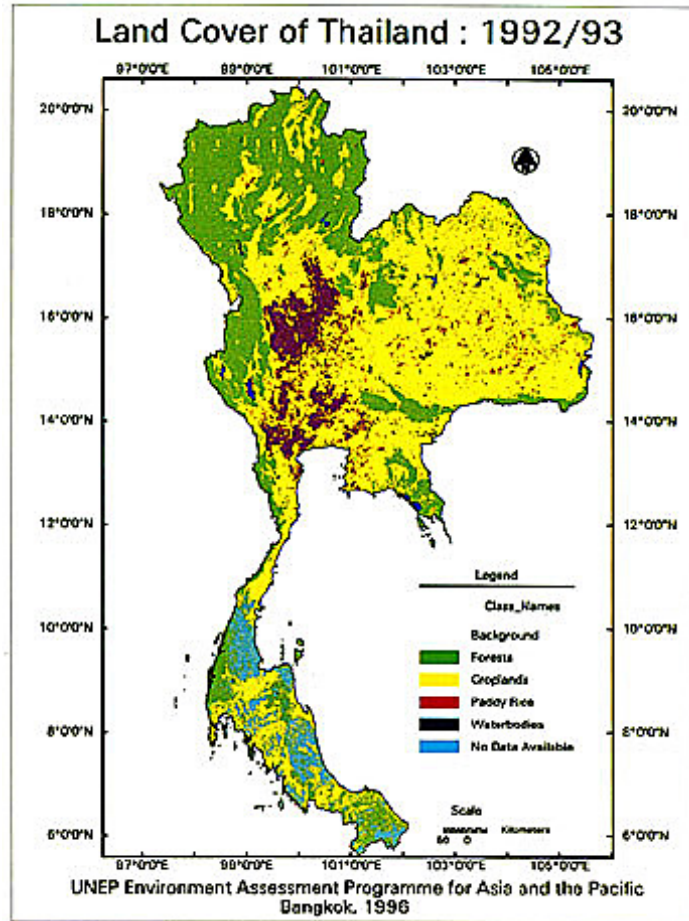
During the early 2000s, the agricultural sector continued to play a vital role in the national economy as there was approximately 42 percent of total labor force engaging in the agriculture. During this time, about 20,960,000 hectares of land was in use, or 41 percent of total land was in farm holdings, of which 50 percent was paddy field (Palayasoot, 2007).



**Figure 9: Manual and animal labor used in the rice cultivation in the past**  
[Source: [www.thai-software.com](http://www.thai-software.com) (2009)]



**Figure 10: Agricultural machinery for intensive rice production**  
[Source: Le Poer (1987)]



**Map 1: Crop area in Thailand with the red color displaying the paddy land**  
 [Source: UNEP (1996)]

Agricultural development in Thailand, during the past five decades, was characterized by the expansion of the cultivated area, diversification into several profitable cash crops, and adoption of intensive agricultural technology. These changes coupled with the increased governmental support and infrastructure development such as roads and irrigation facilities further contribute to increased production.

### ***Government's agricultural improvement programs***

Farmland in Thailand can be categorized as lowland, upland and highland. The lowland farm is generally used for paddy cultivation, while upland is used for field crop production (Cholitkul, 2007). In the past, the major paddy fields were confined to the area with high level of rainfall or with access to natural water resources such as rivers and canals.



Although the annual precipitation in Thailand is enough to produce one crop during the rainy season, the increasing needs to produce rice for export coupled with the rainfall pattern that is not fully corresponding to the critical period of the growing season makes use of irrigation systems highly advantageous.

The first attempt to provide a modern irrigation system in Thailand occurred when the country began to increase export of rice around the year 1896. The water resources development with an intensive irrigation system was introduced in the lower region of the Chao Phraya basin. Subsequently in 1915, the first large scale gravity irrigation project, covering an area of 108,800 hectares was built on the Pasak river (Palayasoot, 2007) to feed the paddy land of the Central region.



**Figure 11: Irrigation canal in Suphanburi province**

Irrigation was still the main feature of the Central Plain agricultural development, a feature which seemed to be relatively lacking in other regions. When the government launched its First National Economic Development Plan during the early 1960s, the agricultural policies was directed toward increasing efficiency and volume of agricultural production in the Central Plain. The main emphasis of this first plan was targeted at

preparing the economic bases for future development through construction and infrastructure procurement (Krongkaew, 1985).

In 1962, the government had commenced the “Ditches and Dykes Program” to a create network of intra-farm and inter-farm irrigation and canal systems. The goal was to directly connect at least 80 percent of individual plots to irrigation ditches (Palayasoot, 2007). In keeping up with the fist National Economic Development Plan, farmland consolidation was initiated as pilot project in 1968, and officially promulgated as the “Land Consolidation Act” in 1974. However, it should be note that, the main reason for the implementation of Land Consolidation, as implemented in Thailand, was not to combine fragmented farm holdings, but to improve water control in the paddy field (Palayasoot, 2007).

There are two types of land consolidation—the intensive type and extensive type. The intensive model comprised of the construction of irrigation and drainage ditches, farm road, water control structures, land leveling, and reallocation of farmer’s plot.

This was to ensure that the particular farm holding had direct access the tertiary facilities. In the extensive model, the farmer’s plot reallocation and land leveling are not anticipated. Only the alignment of ditches and farm roads follow existing plot boundaries was implemented (Cholitkul, 2007). In the year 2005, about 0.3 million hectares of land consolidation areas was reported to be completed where 21 percent of which was under the intensive model (Palayasoot, 2007).

To date, the Chao Phraya irrigation project in Central Plain remains the largest irrigated paddy area. As such, dry season rice cultivation is common practice in the Chao Phraya where three crops per year or up to five crops per two consecutive years could be harvested. Both the “Ditches and Dykes program” in and the “Land Consolidation Act” have contributed not only to the improvement of the agricultural efficiency, but also to changing family structure and settlement form.



**Figure 12: Concrete paved roadway provides easy access to today's paddy field**



**Figure 13: trucks are now able to access directly to the paddy field to transport agricultural products and equipments**

## ***Socio-economic conditions***

Changes in Thai agricultural policy since 1945, which impose strong impact on the socio-economic conditions of farmers, may be divided into two phases. Prior to the 1970s, the government policy did not favor agriculture (Akiyama, 2004). Rice and rubber, which was the major source of income for farmers, were heavily taxed. However, the situation began to change when a civilian government replaced the military government in the 1970s, and started the price intervention program to appease the rural farmers. From the 1980s onward, the government took various steps and implement policies to help farmers which include the profit sharing between farmers and agribusiness operators. Since World War II, factors such as expansion of railways, highways, irrigation projects, as well as increasing global demand for agricultural commodity have had a major impact upon Thai agricultural development and poverty reduction. Expansion of railroads increased the accessibility and efficient transportation of agricultural commodities throughout the country. Construction of highways also enabled the small-scale farmers to increase land holdings to grow more rice for additional cash income. Although the crop was still heavily taxed, the poverty rate of the rural population fell from 61 percent to 43 percent toward the end of the 1960s (*Income Growth and Poverty Alleviation*, 1980)

The improved efficiency in farm management for small farm holders during the 1970s-2000s helped improve the living condition of farmers, particularly for those who produce rice for export. With better income, the farmers can afford better agricultural equipment; and invest in more chemical treatment for pesticide and herbicide management to increase the crop yields. Successful farmers, in Central Thailand, can now resort to a more comfortable lifestyle and dwellings than that of the past.

In addition, the rapid development of the non-farm sector made it possible for farmers to increase their income. According to Shigetomi (2004), the average household income of farmers was nearly four times that of farmers in the 1970s. During the ‘economic boom’ periods in the late 1980s and early 1990s, the poverty incidence throughout the country fell so rapidly that, statistically, the incidence of some regions, such as Bangkok, had approached zero, prompting some in the government sector to

revise the poverty line upward to reflect the changes in population structure, nutritional status, consumption patterns, and prices (Krongkeaw, 2007).

In the early 2004, the Thai government announced the poverty alleviation policy, operated by the National Poverty Eradication Center, as the national agenda. The ambitious objective of the government was to wipe out poverty in Thailand by the year 2009. The war on poverty project was divided into three phases; the first phase, implemented in 2004, involved analysis of poverty problems and creating guidelines for solving the problems; the second phase, to be implemented from 2005 to 2006, involves the easing of the rural population's hardships and other urgent issues; the third phase, to be carried out from 2007 to 2008, entails the implementation of sustainability solution for tackling poverty.

During the first phase of implementation, the Thai government first declared a three-year debt moratorium for farmers. By circumventing the local government, the National Poverty Eradication Center directly injected the capital funding to village committee to be used, at its disposal, to invest in any community improvement project. Additional help from the government came in the form of price interventions for agricultural products to ensure price stability and fairness. Extra steps were made to open international markets for Thailand's main agricultural products, such as rice and rubber. With these interventions, the crops' price increased significantly. For the first time, the Thai farmers had enjoyed the government's systematic and efficient resolution to the agricultural problem. The government eradication program, however, ended before its intended time due to the political turmoil, which led to the overthrow of the government by the military coup d'état in 2006.

However, during the first three years of the poverty eradication program, the rural poor were able to have direct access to capital markets. The three-year debt suspension program helped farmers with smallholdings to solve cash flow problems. Small and Medium Enterprise (SME) banks, created by the program, spawned large numbers of small and medium businesses, mostly agricultural related and initiated in rural areas.

Jitsuchon and Ritcher (2007) reported noticeable benefits from the government "Poverty Eradication Program." Next to Bangkok, the capital city of the country, the

proportional reduction of poverty is the largest in the Central region; during which time, the poverty level in Suphanburi and the surrounding area had improved to 0-7.4 percent.

In short, the poverty condition of the rural population, particularly in the Central region, of Thailand has been improved significantly since the end of World War II. The Thai farmer's ability to adapt to changing market conditions contributed to the country's agricultural success, but even more important was the availability of large areas of virgin land for cultivation. Between 1950 and 1980, agricultural holdings nearly doubled to an estimated 22 million hectares (Krongkaew, 1985).

### ***Migration of the rural population and changing family structure***

Improved infrastructure, transportation systems, and intensive farming techniques that started in the late 1960s had helped increase crop yields, which resulted in better income and capital investment for individual farm holdings. As farming became more efficient, younger generations of farming families were free to mobilize to the city area. The better infrastructure and road access have also contributed to increased opportunities for off-farm income, which eventually led to changes in the overall economy and the family structure in the country.

The rice production labor force, of the entire country, had decreased from 51 percent during the 1972-1975 to 36 percent during the year 1992-1995 (Isvilanonda, 2000). The impact of the mobility of labor force significantly impact the rice production of the Central region due to its close proximity to capital city area.

The increasing needs for off-farm incomes and the mechanization of farm production coupled with easy access to transportation had contributed the large scale migration of the rural population (Knodel, 2007). Many young adults have migrated to the urban area as a means to earn additional income as well as to provide financial support to their parents.

### **Summary**

Lawrence (2000) notes that the social dimension includes patterned processes of everyday life which encompass the existential being of people, the actuality of daily life

and surroundings. The socio-cultural factors have been known to be a crucial force in shaping an idealized framework of the people's view and needs toward the built form.

From this review, we have witnessed some drastic changes in the social dimension in the past 50 years in the social life of the Central Thai farmers. Intensive rice cultivation system along with the increased access to water source, allow the farmers to effectively produce more crop output, while at the same time require less manual labor. Many young generations were free to migrate to urban areas to obtain additional off-farm income. With more capital gain, the farmers have been able to acquire more farms holding to increase the rice production, the accessible water source from the network government created irrigation canals and paved road allow them to relocate to the new farmland. Families of relatives were no longer required to live together in a large cluster to take turn to help one another out in the field.

Drawing from Lawrence's (2000) remark about relationship between social forces and the built setting would make us wonder whether the original traditional house form would still be able to support the changing needs and lifestyle of the contemporary rice farmers. And if there is any change in the built setting, the following questions would be that **“what are the changes in the social context that have impacted the farmers' use of house?”**

## Chapter Three

### Review of architectural studies of the traditional Thai house

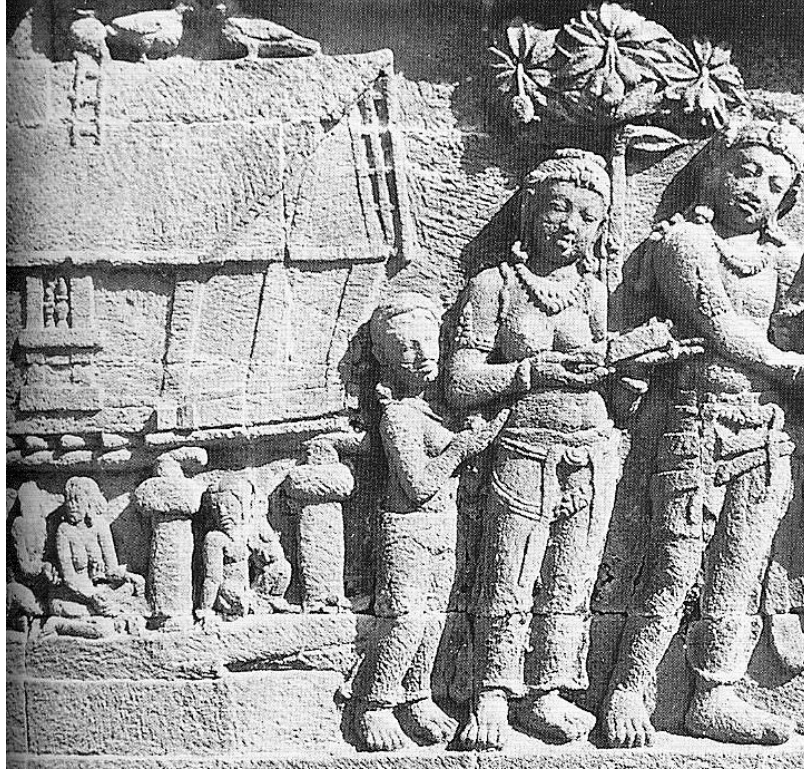
This chapter reviews the available literature on the history, physical characteristics and other distinctive aspects of the traditional Thai house. It begins with a general overview of the meaning and characteristics of the traditional Thai house, and is followed by a focused review of the detailed characteristics of the traditional Thai house in the central plain, as well as their traditional lifestyle of the Thai farmers. The chapter concludes with the discussion on the research approaches, distribution, and the areas that has been overlooked in the architectural studies of the traditional Thai houses.

#### ***History and evolution of the traditional Thai house***

##### **Origins**

The time period for the origin of the ‘house on stilts’ cannot be determined exactly. Chaichongrak and colleagues (2002) report on early evidence of the ‘house on stilts’ can be found on stone relief’s from the 8<sup>th</sup> century *Dvaravati* civilization at Borobudur in Indonesia (see: Figure 14). However, Jumsai (1997) believes that the origin of this house type can be traced back as far as 6,000-5,000 BC. Supporting evidence for his argument comes from ancient clay models of the piled dwelling excavated from Kiangsi Province of Southern China.





**Figure 14: Bas-relief from Borobudur showing a house on stilts**  
[Source: Chaichongrak et al. (2002)]

## **Distribution**

To search for the common origin of the Austronesian house or the ‘house on stilts,’ Jumsai uses the historical interpretation approach to study the formal characteristics and symbolic features of vernacular architectures. With this approach he surveys a series of houses across the geographical expanse of the ‘Asian waterfront’ including Malaysia, Thailand, and Indo-China to the foot of Himalaya in Nepal and the Naga Hills in north-east India and south China.



**Figure 15: Various forms of house on stilts**  
**Clockwise from toplef: the Naga house in India, Dokan house in Sumatra, hill tribe house in Northern Thailand, Yao hous in Vietnam, Ise Shrine in Japan, the granary in Okinawa, the house in Samosir, and the Black Thai house in Vietnam.**



Figure 16: Southeast Asia region where house on stilts are found  
 [Source: www.worldmap.co.uk (2003)]

## **Evolution in response with geographical condition**

Under the mentoring of Buckminster Fuller, who had a lifelong fascination with nautical architecture, Jumsai postulates that the steep tapering gable roof, in particular, bares a close resemblance to an overturned boat that in the past would have been used by seafarers as a temporary shelter upon reaching the shore. Accordingly, Nisbett (2003) observes that Asian people tend to evolve culturally to live harmoniously with the environment. The water-based cultural background and “amphibious habitats” are thus the products of this adaptation to living with the continual ebb and flow of interglacial floods.

The traditional Thai house presented a perfect response to the geographic and pulsating environmental conditions of Southeast Asia (Chulasai, 1997). The high platform and spacious terrace was well-suited to the tropical climate which alternates between baking sun and abundant rain fall. The steep roof ceiling provides perfect ventilation for perpetually hot and humid weather. Stilts protect the house from submerging in floods during the monsoon season.

## **Utilizations**

In terms of the utilization, Jumsai (1997) provides a rationale for people living elevated above the ground with an open space underneath as a solution for providing security and protection from wild animals, seasonal floods, and good ventilation. The inhabitants use the area on the ground level, right underneath the living quarter, to work and to store implements. Agricultural instruments, such as cart and plough, fishing or weaving implements were kept underneath the house along with farm animals such as ox and water buffalo (Waterson, 1991). The row boat was also kept underneath the house if the house is right on the water or the area is often troubled by flood.

## **Differences in regional characteristics of the traditional Thai houses**

Although the traditional houses throughout Thailand are known to have common physical characteristics, there are regional differences in some features of these houses. Jumsai (1997) finds that the stilts, that support the house, become progressively shorter as one goes deeper into the peninsular and to higher ground further north and inland.

However, he does not provide an explanation for this observation, and which for the moment must remain a subject for further investigation.



**Figure 17: Clockwise from the top; the Central, the Northeastern, the Northern, and the Southern vernacular house style**  
[Source: Chaichongrak et al. (2002) and Peranonda (1982)]

Major regional styles of the traditional Thai house include those of the Central region, the North, Northeastern and the Southern style (see: Figure 17). Distinctive regional styles may include features such as choice of materials, pitch of the roof and layout of the interior. This study focused solely on the Central Thai house. The characteristics of the traditional Thai house of the central region will be discussed extensively in the following section.

## ***The Central Thai houses***

### **Settlement characteristics**

The central region of Thailand can be described as a vast area of lowland plain with rich soil, which is essential for rice and wetland agriculture. The several rivers that flow through the region serve as main arteries feeding the central plain of Thailand. The rivers in this region are important to both agriculture and transportation. The annual flood

of these rivers lasts approximately six months (Gutkind, 1946) ensures the fertility of the central plain. It is assumed that the richness of the land influenced settlement of this region.

Chaichongrak (1979) observes that, when comparing with the other sub ethnic Thai groups, the orientation of the Central Thai farmer's house are based on the easy access to the main transportation route. Houses situated on the banks of the river or canal face toward the water, which provides the occupants' access to the main life line to the community. The same can be said for houses located next to roads.

All of the houses in the same community are usually oriented in the same direction. The first house in the community sets the direction for the rest of the houses in the settlement since Thai farmers believe that a disorderly house orientation will cause disharmony among its residents. This belief might be indicative of a collectivist oriented community as the house symbolizes how residents see themselves (Despres, 1991b) and desire to be seen by the fellow villagers.



**Figure 18: Temple mural, from Wat Suwanram, illustrates cluster of the houess along the river line**

Settlement characteristics of the Central Thai farmers vary widely. Chaichongrak (1979) classifies the settlement characteristic of the Central Thai farmers' houses into three types as river cluster, highland cluster and homestead (see: Figure 18& Figure 19).

He notes that the oldest settlement type is the river cluster. It can still be found along major rivers and canals. In many respects the highland cluster is similar to the river cluster except of course for its orientation with a hill instead of water. Residents of the both the river and highland settlements typically must travel long distances each day to and from their farmland. For some farmers the distance requires that they temporarily relocate to their more distant fields during the harvest season.

Lastly, the homestead settlement refers to a single house or a compound of houses that is located on the individual's farmland or orchards away from the village. The residents of the homestead settlement have the advantage of close proximity to the farmland but at the tradeoff of reduced security and increased isolation. A combination of all three types of settlements may be found in the same area depending on the geographical location of the region, and the ownership of the farmland.

### **Social change and habitation pattern**

Since 1957, the arrival of electricity and the construction of major highways have caused a rapid transformation of rural Thailand. Traditional farming practices have been replaced by modern machinery, allowing for the shift from subsistence agriculture to commercial production. Farming has become increasingly profitable and less demanding. Younger generations of farmers are free to seek employment in non-agricultural sectors, and relocate away from their home towns. Given the burgeoning economic development of the past few decades, Ando and colleagues (2008) observe that Thailand is still far less urbanized when compared to other Southeast Asian countries, such as, the Philippines or Indonesia.

Thailand's population growth has decreased significantly resulting from an effective family planning campaign during the 1960-80s. Between 1969 and 1975, marital fertility has decreased by close to 20% due to the formalized governmental family planning of the "National Family Planning Program" that has been established in the 1970s.

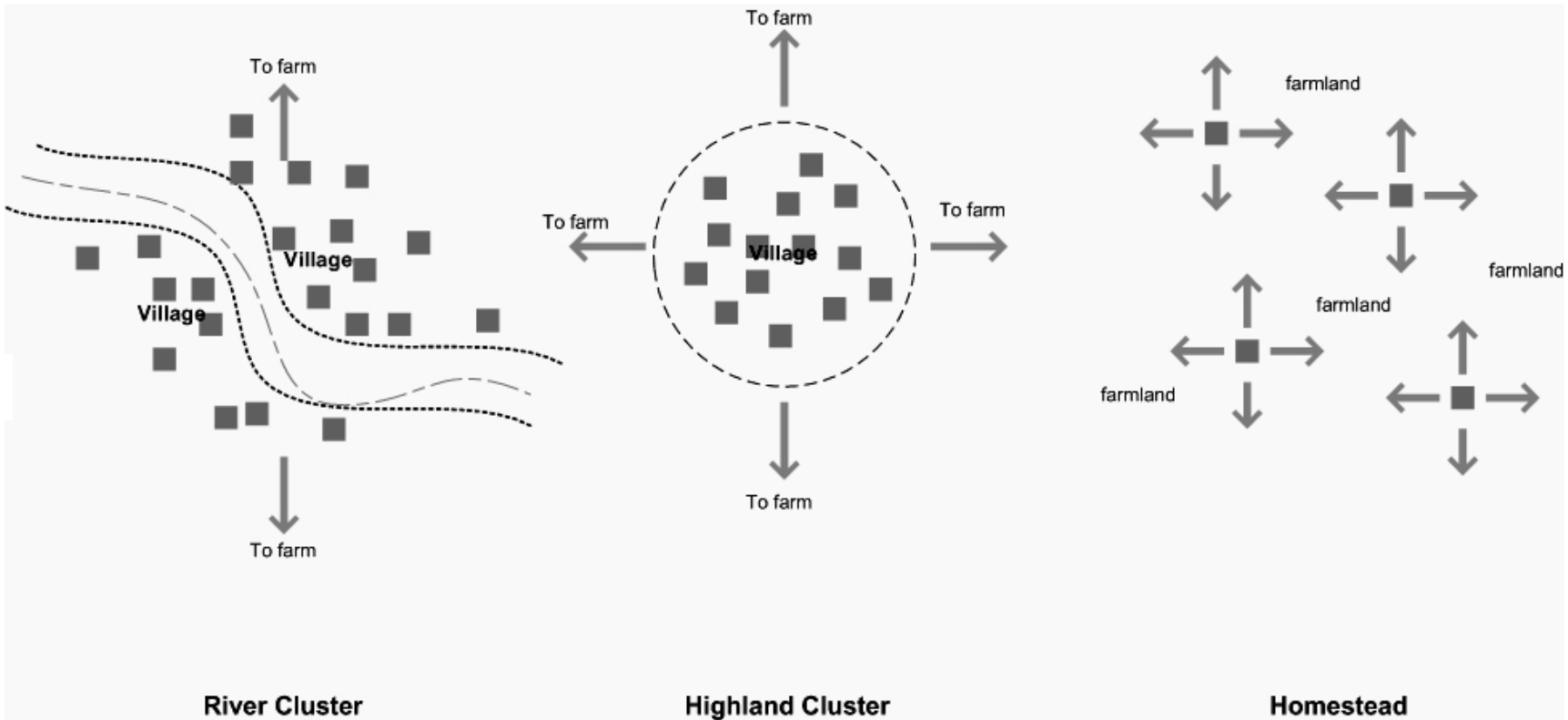


Figure 19: Types of settlement in the Central Thai plain  
[Adapted from Chaichongrak (1979)]



With the implementation of the program, the preferred number of children per family has noticeably declined, and the difference in effective population control between rural and urban populations has been diminishing. This has resulted in the overall decline of the annual population growth rate of Thailand to just about 3% in the 1980s. (Debavalya, 1981).

Decline in population coupled with mobility of the labor force have contributed to the reduced family size particularly in the farming areas. Many elderly Thais with a smaller number of family members still remain in their traditional villages. These elderly along with the fellow villagers have received good health support from an effective system of primary health centers, and they enjoy relatively high levels of public services such as water, utilities and sanitation (Ando, 2008).

Characteristically, most rural villages in Thailand are divided into local units or neighborhoods. The village or the hamlet often consists of related households. Activities such as house-raising, cultivating or harvesting the crop might be undertaken with the help from close kin in the village. The growing commercialization of agriculture and increasing landlessness and tenancy in the 1980s diminished the ubiquity of reciprocal work arrangements in the rural community of Thailand, and this has been replaced by the hiring system (Amyot, 1994a, 1994b, 1976).

The only investigation that addresses the relationship between the traditional Thai house and its transformation along with the farmers' life pattern from 'natural living' to a more 'control living,' environment is the anthropological study by Duangwiset (1996). Despite the emphasis on the description of the changing family structure, agricultural technology, and activities in the daily life of the modern farmers, Duangwiset identifies the disappearance of shared working space that used to be indispensable parts of the farmer's house compound such as the buffalo house, pond, and house yard. He describes how the Central Thai farmer's change from the mode of community life, in which people shared the same working space and activities to that of the private life where people keep to their own family. In addition, the demarcation between the work area (the farmland) and the domestic (dwelling) area have been increasingly discernable.

## **Architectural features of the Central Thai house**

There are two types of the traditional houses in Central Thailand as described in the preceding chapter—the bamboo and the hardwood house. However, this study focuses and limits the discussion to only the hardwood type. The hardwood house of the Central region can be described as having a truncated A frame or the inverted A (Chaichongrak, 2002). The modular structure of the house is based on a system of prefabrication using a structural frame and panels that allows for flexible assembly and modification of homes. Houses that use this construction method can be extremely mobile and easily relocated as described for Langkawi of Malaysia (Carsten, 1995).

When compared to house styles from other regions, the Central Thai house is distinctive for its steeply curved roof and the elegance and lightness of form (Devakula, 2000). The dainty look of the house is augmented by the fact that the living quarters rest on a large open platform supported by posts raised seven feet from the ground (Chaichongrak, 1979; Charernsupkul, 1978).

On the raised platform of the Central Thai house, the living quarters are made up of one or more the sleeping units and a kitchen constructed around the open terrace. The open terrace takes up at least 40 percent of the entire living quarters (Chaichongrak, 1979; Chaichongrak et al. 2002), and enables movement from room to room. A terrace also serves as a communal space where family members can eat meals together, talk or perform ceremonial rites on special occasions. Sometimes, the residents of a larger house may grow a tree in the middle of the terrace to provide shade during the heat of the day.

The Central Thai house is also known for the use of differential floor levels to define boundaries between areas within the house (Devakula, 1999; Chaichongrak, 1979, 1996, 2002). Typically the main platform is constructed with three levels of flooring with the terrace being the lowest, followed by an intermediate level verandah, and topped off at the highest level with the dwelling units. While the existing literature describes this characteristic of the Central Thai house, it falls short of providing a rationale or analysis of the symbolic meaning of such a flooring arrangement.

## House Size

Chaichongrak (1979) notes that the typical house of the Central Thai farmer can be classified as either a single house or as an extended house. The single house is a smaller dwelling and is suitable for a nuclear family consisting of a husband and wife and their unmarried children. The single house can be considered as a starter house to which extra adjoining compartment might be added later.

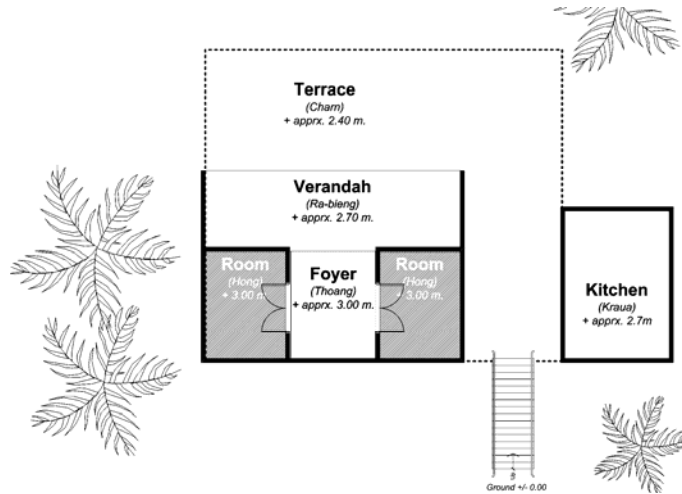


Figure 20: Diagram of a typical floor plan layout for a single dwelling

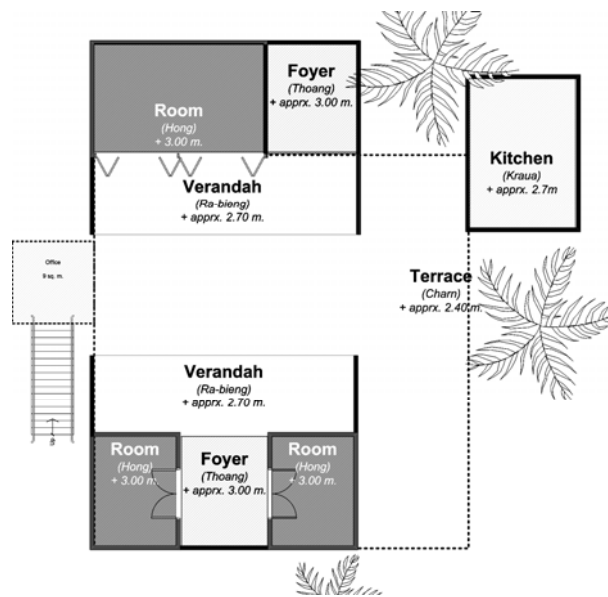


Figure 21: Diagram showing a typical floor plan of an extended dwelling

In an extended house the number of compartments (ruen) may vary depending on the size of the family and its economic status. With the single house often has only a single closed compartment; the larger extended house may have six or more.

Chaichongrak observes that the technique of adding compartments (ruen) around the terrace is a practical construction method since difficulties involving modification of the existing structure can be largely circumvented.

### **Spatial organization and interior**

Study of the spatial organization and interior of the traditional Central Thai house has received little attention; however some points can be drawn. For instance, Chaichongrak (1979) reports the ratio of the terrace to the verandah and the closed compartment as 4:2:4; thereby indicating that the floor space is largely unenclosed. The arrangement of the dwelling units and the kitchen around the main terrace can be categorized into two groups; 1) all of the closed compartment units are arranged with the long side facing and parallel to each other, but there is no unit on the end sides of the terrace, and 2) all of the closed compartment units are arranged around the main terrace.

The terrace serves as the main circulation zone as well as a multipurpose area for the entire dwelling. Next to the terrace is the verandah, which serves as a transition space between the terrace and the living compartments. Since the verandah is sheltered by the extended eaves of the roof, it is usually used for relaxing, conversing, and receiving guests. Chaichongrak describes the living compartment or 'ruen' as a private area used mainly for sleeping. However, his report is more concerned with the sleeping ritual and the orientation of the body than to provide a general description of the variety of activities that may occur in this unit.

Another important component of the traditional Thai dwelling is the kitchen. The Thai kitchen is usually built as a separated compartment, but connected to the other living areas by the terrace. The kitchen space is used for both preparing food and as a family dining area. The hearth is constructed of tightly packed earth in a hardwood frame rising approximately 30 cm above the floor, and is most often located in a corner of the kitchen. The fuel used for cooking is firewood. Because Thai cooking often uses spices that

produce pungent smells and smoke, the walls and ceiling of the kitchen are often made of woven bamboo panels to increase air ventilation.

Rice farming is strenuous work demanding long hours in the fields tending crops (Gladwell, 2008). Farmers tended to live simple and practical lives (Duangwiset, 1996). Most activities, such as eating, preparing food, or sleeping are performed on the floor sitting on reed mats. Thus, there is no need for furniture for such activities.

Chaichongrak (1979) observes, from his fieldwork experience, that the homes of most of the farmers had only a few pieces of household furniture such as trunks for keeping clothes, and the glass cabinets for keeping dinnerware to be used during the ceremonial occasions. Occasionally, in a wealthy home, there will be found a table and chairs, but this practice was adopted from Chinese merchants who have traded with Thailand for centuries.

### **Summary**

The review in this chapter has also brought to light another gap in the vernacular architectural studies in Thailand. The majority of the studies have taken a fragmented and incomplete view to understand the traditional Thai house.

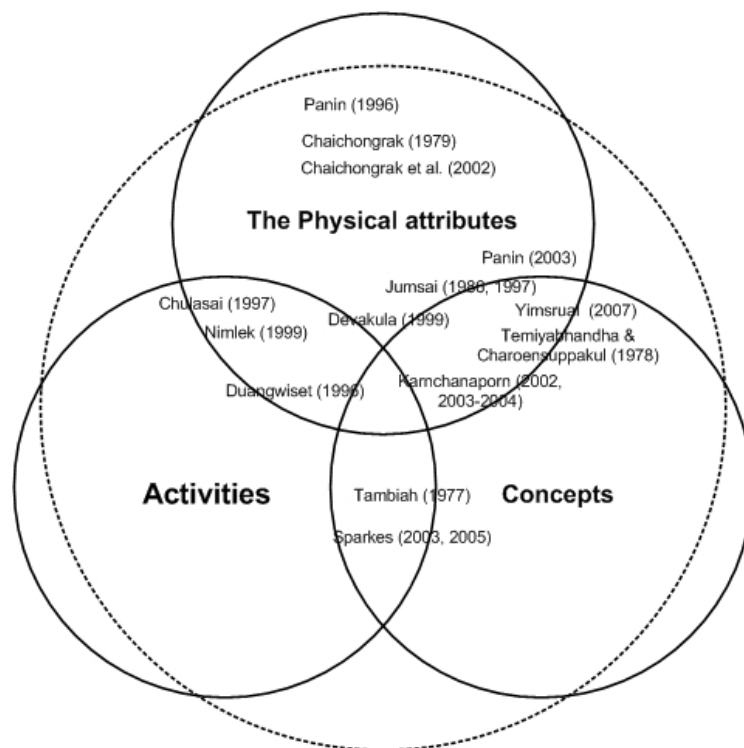
To elucidate this problem further, the three constituents of the Place Model (see: Figure 22) is used to categorize existing published research on the traditional house of Central Thailand shows that most of the research has focused on the physical attributes of the dwelling (Chaichongrak, 1979, 1996; Chaichongrak et al., 2002; Chulasai, 1997; Kalayanamitra, 1996; Peranonda, 1982) . Only two studies have focused on activities and concepts of the Thai house (Jumansai, 1975; Duangwiset, 1996).

The built form cannot be understood separated from the society and the people whom it serves. The focus of the study has been devoted to the issues such as aesthetic property of the house, which was a subject for preservation purposes (See: Figure 23). Thus, this suggests a direction for further research using a holistic approach where this dynamic in such a setting is thoroughly explored and articulated.

The theme that emerge from this review underlying the lack of understanding about the dynamic between the three constituents in the Place Model) where the alteration process and the motive that are influenced by the changing of physical and

socio-cultural needs of the occupants have simply been neglected. On the other hand, if the house is viewed as an evolving form ready to be shaped and molded to suit the needs of its occupant, then, a question arises: “**whether there is any change in the house form,**” and if so “**how would the physical characteristics of the house be transformed in response to such a changing environment?**”

There are so much more that we can learn from the vernacular architecture. It is my hope that the knowledge gained from this study will confirm what Gillian Darley has stated that the aesthetic aspect of the vernacular architecture, although attractive, is besides the point....”their appeal lies in the sense that they make.”



**Figure 22: Distribution of the focuses of existing research studies in Thai vernacular architecture as projected onto the Canter’s (1997) “Place Model”**

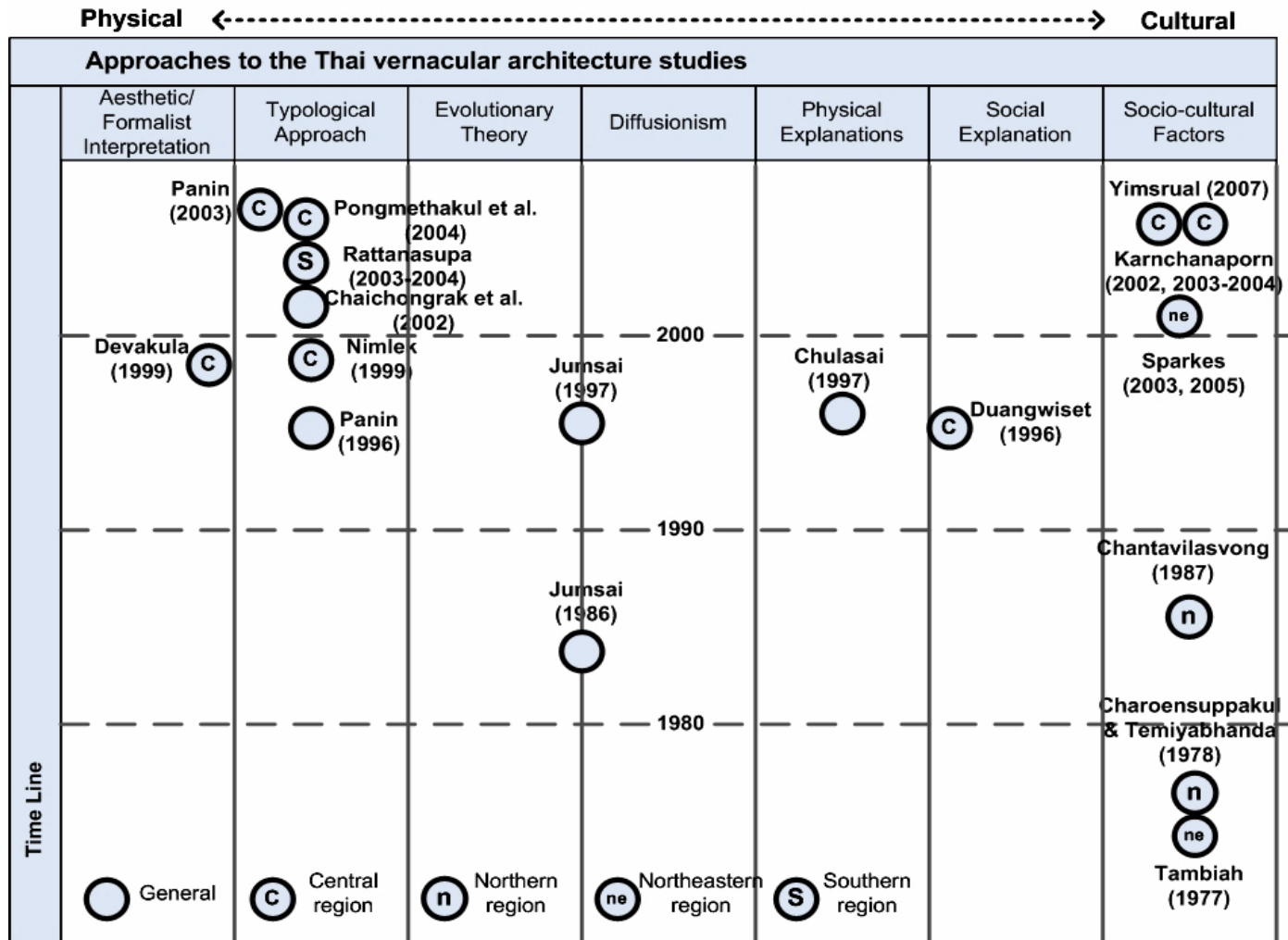


Figure 23: Diagram showing the distribution of the focus of the vernacular architecture research in Thailand [Adapted from Lawrence (2000)]

## **Chapter Four**

### **The review of the anthropological studies of the traditional Thai house**

The focal point of anthropology is the study of people and their culture. Added to architectural studies of the built setting that for the most part have tendency to focus on the more material aspect of the dwellings, the anthropological study of the architecture, reviewed in this chapter, present an alternative approach in interpreting the interrelation between buildings, people, and ideas. The topics discussed in this chapter focus on the ritualistic aspect of domestic life such as house building ceremony, kinship, gender role and religions.

#### ***Gender roles and religious cosmology in Thai domestic life***

The relationship between gender roles and religious cosmology in Thai society are inseparable. The aim of this section is to examine the interplay of gender roles and religious cosmology, and to provide a context for understanding their influence upon the domestic lives of Central Thai farmers.

Gender relations among Southeast Asians, including the Thais, differ from those of the predominantly patriarchal societies of the neighboring civilizations of China and India. In Thai culture, women participate in both familial rituals and division of labor with greater equality than in other societies (Sparkes, 2005; Sparkes & Howell, 2003; Wongthet, 2006). Although when it comes to politics, women remain in the background for the most part, Thai women are also known to be very influential in the decision making of male relatives through participation in female social networks (Wongthet, 2006).



Gender relation in Thailand derives from a matrilineal descendant system, which is distributed throughout the Southeast Asia region. Matriliney, can be depicted as a system where the common ancestors can be reckoned along the family line of the mother's (Davies, 2002; Wongthet, 2006). The Southeast Asian countries with this type of family system include those from the mainland such as Myanmar, Thailand, Laos, Cambodia, and Vietnam as well as archipelagos such as Malaysia, Indonesia, the Philippines, and Brunei Darussalam.

The marriage and residence rule in Central Thailand is uxori-local, which simply means that the groom will relocate into the bride's ancestral house upon married. Since her family tie is not severed, a woman will continue to receive support and protection from her family throughout the stages of her life. However, it should be noted that the power and authority within a matrilineal society are still exercised by men. A woman will not become the head of the household despite her ability to secure her family ties and retain a respectable status within a community. It is the man who married into the family who will later become the patriarchal figure of the family, and will be responsible for providing for the family as well as for the protection to his female offspring.

Although the matrilocal marriage system has operated as an empowerment mechanism for Thai women throughout history (Wongthet, 2006), gender relations in Thai culture, are encroached upon by two contrasting but complementary religions—Buddhism and Spirit religion.

In Thailand, Spirit religion or Animist beliefs have been practiced hand in hand with Buddhism. To Spiro (1967), the practice of the two religions are quite different, but compatible with each other. Spiro reasons that Buddhism is guided by ethical (precepts) and the principle of salvation and renunciation of the material world; the Spirit religion is attached to material life and magical ritual. The Buddhist philosophy is sometimes perceived as a set of principles too intangible, and too ideal for laymen to relate to. Spirit religion, on the other hand, provides substantial direction related to practical existence and helps to deal with the fear and ambiguity of life here and now (Karnchanaporn, 2003-2004).

As opposed to the male dominant Theravada Buddhism doctrine, where a man is believed to be higher or superior to a woman, attributes of Spirit religion symbolize the

complementary role between men and women in the labor division as well as gender relations in the household (Sparkes & Howell, 2003; Tambiah, 1976). This complementary contrast can be interpreted as a mirroring of the division between the man as father and figure of authority and power; and the woman as mother and part of a female descent group concerned with continuity and fertility of the family line.

The cultural anthropologist believes that feminine empowerment in the Thai familial system has been toned down by the concept of hierarchical gender relation, influenced by Buddhist doctrine, but sustained by the practice of the Spirit Religion that is still prevalent in Thai culture. The dynamic of these beliefs have also been distinctively displayed in the domestic life and arrangement of the Northeastern Thai.

**Table 1: Opposing spheres of gender and cosmology**  
[Adapted from Sparkes (2005)]

<b>Gender hierarchy/ Male dominant sphere</b>	<b>Gender complementary/ Female dominant sphere</b>
● Buddhist sphere	● Spirit religion sphere
● Power imputed to Pāli scripture	● Power inherent in nature
● Chastity and a-sexuality	● Fertility and procreation
● Transcendental soul	● Life essence, ancestor, female descent groups
● Buddhist temple, monastery	● Household

### ***The house building ceremonial rite***

A numbers of research studies on traditional Thai houses, in the past, have exhaustively recorded the ritual of house buildings (Chaichongrak, 1979, 1996, 2002; Charernsupkul, 1978; Kalayanamitra, 1996; Pongmethakul, 2002; Komin, 1979) but only recently the studies by Karnchanaporn (2002, 2003-2004), Sparkes (2005), and Yimsural (2007) have attempted to explore symbolic references associated with this ritual.

In the past, the home was a fundamental shelter that provides protection against ‘fear’ of a terrifying natural world (Rykwert, 1982). Karnchanaporn (2002a) observes that the reasons for fear on the part of Thais in the past was due to the troublesome ecology and natural calamities caused by the indeterminable geographic and climatic

conditions. Although the source of fear may be altered, the modern Thais still perform house building ceremonial rites as well as keeping the spirit shrine or abode in their modern home as a way to cope with chaotic urban life.

Similar to the Minangkabau society of the Austronesians (Alexander, 2007), the Thais believe that a proper house building ceremonial rite helps ward off their fears, by purifying the household of misfortune, sanctifying ownership and establishing the auspiciousness of the household. The house is perceived as a place to provide both physical as well as emotional security to the occupants. While residing in the home, the occupants should also feel that they coexist harmoniously with the surroundings. (Komin, 1979; Tambiah, 1976; Sparkes, 2005; Karnchanaporn, 2002a, 2002b, 2003-2004; Yimsrual, 2007).

Rituals pertaining to the building of the house or the organization of space within the household are performed according to the values prescribed by the cosmology of the Spirit religion (Sparkes, 2005; Tambiah, 1976; Waterson, 1991). In the building ceremony of the Northeastern Thai villages, Terwiel (1980) notes a ritual called "leasing from the gods" where people perform the rites to invoke four different spirits to watch over the dwelling. During the process, the house owner will specifically invite the benevolent spirit into the plot to live in the prepared abode. This is to ensure that the new house will be cared for and protected from evil spirits permanently.

The specific attributes of each spirit, invoked by the house owner during the ceremonial rite, symbolize the complementary role between men and women (Sparkes, 2005; Sparkes, 2003; Tambiah, 1976). Female spirits tend to symbolize fertility, human procreation, and continuity of the female descent group. To make a successful household, the house will need to have protective and caring male spirits that symbolize authority, power, ownership and control. Anthropologists (Sparkes, 2005; Tambiah, 1976; Waterson, 1991) suggest that the gender associated with these guardian spirits may be related the prescribed gender roles and labor division of the householders.

Although many have taken the house building ritual literally, and believe that failure to follow the ceremonial ritual may result in misfortune for the householders. Additionally, I hypothesize that the animist rituals that imbue the house building

ceremony may serve as a set of principles for constructing a house suitable for the local climate and geography (Karnchanaporn, 2003-2004; Komin, 1979).

**Table 2: Spirits invoked by the homeowner during the house building, ceremonial rite**  
**[Adapted from Sparkes (2005)]**

Spirits	Thai word (Phonetic)	Gender	Role of the spirit
<b>Lady spirit of the woods or the nymphs</b>	naang mai	<b>Female</b>	<ul style="list-style-type: none"> <li>● Protection of the house and peacefully cohabitant</li> </ul>
<b>Mother Earth</b>	mae thoranee		<ul style="list-style-type: none"> <li>● Ongoing relationship of sending offering to the dead, protection from evil spirits and benevolent intervention</li> </ul>
<b>Lord of the land</b>	phra phoom	<b>Male</b>	<ul style="list-style-type: none"> <li>● Leasing the plot of land from the spirit</li> </ul>
<b>Naga</b>	naak		<ul style="list-style-type: none"> <li>● Assertion of control over the force of nature</li> </ul>

In comparison to the Chinese Feng-Shui tradition, the Thai house building ritual is essentially an fusion of the indigenous knowledge of the environmental technology (science) with the religious cosmology (belief) about how to build a house in correspondence with the social and physical milieu.

### ***Impact of gender roles on the traditional dwelling***

Gender relations in Thai society are objectified in the design of some of the vernacular dwellings such as the Northeastern home (Sparkes, 2005; Terweil, 1994). Unlike the traditional Thai house of the central plain, the Northeastern Thai house has been the subject of numerous anthropological and architectural research studies. It is conceivably due to the robustness and attractiveness of the local customs that they have not been tampered with by today's modern technology. Given the lack of previous research studies directly relating to the Central Thai house, I will discuss research on the Northeastern Thai house, which is most nearly similar. Furthermore, some rituals and

key symbolic references are common of the two regions, and may be warranted as a platform for the discussion.

The spatial arrangement of the Northeastern dwelling strictly abides by the instructions of the Spirit religion. A typical dwelling can easily be divided into male areas and female areas. Men usually keep themselves out of the kitchen—the female area. Sparkes (2005) reports that the Northeastern men avoid using the kitchen even when they cook ritual food; they choose to prepare and cook in the open area on the ground instead of entering the kitchen. Likewise, the male area is considered ‘off limits’ to females, particularly during menstruation.

The female part of the house, the kitchen, is the most utilized area of the living quarters. Izikowitz and Sorensen (1982) observe that the kitchen area is associated with wetness which is a symbol of procreation. In the Northeastern village, rituals and practices involving pregnancy and postpartum preparations occur in the kitchen area. To Sparkes (2005), the kitchen seems unfit for its functional use because of the lack of natural light that helps illuminate and dry out the room. The kitchen area is exposed to rain during the monsoon season causing the room to be damp and overwhelmed by unpleasant odors.

In contrast, the male area, (e.g. the family altar) where the functional use is minimal, but more significant symbolically, is located in the area with the best ventilation and proper natural lighting. As such, Sparkes (2005) concludes that the Northeastern Thai house’s spatial arrangement is more symbolic than functional.

The orientation of the each area within the house is gender related, and extremely important in the traditional Thai cosmology. Thai words for geographical orientation have a hidden symbolic meaning. According to the meaning described in the “rites for house building manuscript,” the holy and auspicious objects are usually located in the North and the East where those of lesser value or unfavorable objects are arranged in the South and West part or a combination thereof.

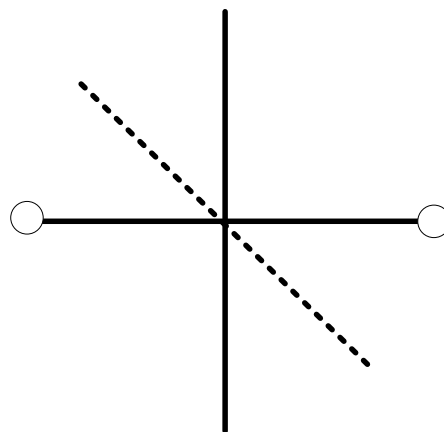
There is also a spatial concern regarding right-left which reinforce the binary opposition between genders. Traditional Thai belief prescribes that the husband must sleep on the right of his wife since ‘right’ is considered sacred. This belief may have its origins in Hinduism and is often an important consideration in a ritual (Kirsch, 1977;

Sparkes, 2005; Tambiah, 1976). On the contrary, the female part of the house, kitchen, is usually located in the Southwest wing of the dwelling which is considered an inauspicious direction.

**Table 3: Symbolic meaning of the geographical orientation**

<b>Geographical Orientation</b>	<b>Thai words (Phonetic)</b>	<b>Symbolic Meanings</b>
<b>North</b>	Nua	Above
<b>South</b>	Tai	Under, Below
<b>East</b>	Tawan-ok	Direction where the sun rises, Commencement
<b>West</b>	Tawan-tok	Direction where the sun set, Fall

The vertical spatial arrangement of the traditional house, of the Northeastern village, also conforms to the gender hierarchy prescribed by complementary views of Buddhism and Spirit religion cosmology. The higher level is for sacred or auspicious objects and man, and the lower level is for inauspicious ones and woman. For example, the altar section is comprised of two parts namely the Buddha’s altar (male) and the ancestor altar (female). Buddha’s altar must be placed higher than the ancestral altar. In addition, the kitchen (female) area is usually located on a lower platform than the main quarters of the house.



**Figure 24: Direction and symbolic meaning for spatial arrangement in the northeastern Thai house**  
[Adapted from Sparkes (2005)]

In the traditional Thai house, gender association appears not only in the spatial division, but also extends to title assignment for features of the house (Charernsupkul & Temiyabhanda, 1978; Jumsai, 1997). According to the traditional “rite of house

building” manuscripts, several structural features of the house are female while the joinery components are alternatively male and female (Jumsai, 1997; Sparkes, 2005; Chaichongrak et al., 2002; Charernsupkul & Temiyabhanda, 1978). Interestingly, many prominent components of the traditional Thai structure have a female gender association as they begin with the prefix word ‘nang’ (lady) or ‘mae’ (lady or mother). Table 4 shows some examples of the component of the traditional Thai architectural structure with a female title.

**Table 4: Examples of the component of the traditional Thai structure with a female title**

<b>Thai name (Phonetic)</b>	<b>Structural component</b>
<b>nang-mai</b>	A wood plank
<b>nang-rieng</b>	A palisade
<b>nang-jaran</b>	A column supporting extended eaves at the side of the house
<b>nang-um</b>	A horizontal log capping the top of a palisade
<b>mae-kradai</b>	A stairway

The reason for gender assignment has to be a subject for future investigation for Thai vernacular architecture scholars. I do speculate that this may be due to the old Thai belief about the tree nymphs. The old Thai were convinced that a tree nymph (nang-mai) or a female spirit resides in each tree. As such, the house structure which is made from the tree log consequently inherits the female characteristics of the tree nymph.

### **Summary**

As typical of anthropological study, the ritualistic aspect of the Thai house has been the focal point of the anthropological studies of the Thai house even though usage for day-to-day affairs outweighs ritualistic uses. Attentions have been devoted to investigation of the ritual constructs related to house building, ancestor, kinship, and gender role. Thus, more research is called for to investigate the domestic life in the vernacular Thai house.

This review indicates a strong association between gender role, spatial arrangement, and religions in the Northeastern Thai society. House is seen as a living being where division of gendered roles are strong and associated with domestic and natural elements with corresponding characteristics. Very little is known about the perceived meaning of the house and the domestic life in the Central region of Thailand which is well known for its traditional house as the anthropological studies of the domestic life in Thailand have not been distributed evenly; a large portion of the studies have been clustered around the North and Northeastern house. (See: Figure 11, Chapter 3).



## Chapter Five

### Theoretical influences

This chapter discusses the influence from anthropological research approaches and interpretive lenses to studying the socio-cultural dimension houses. Included in this chapter, is a discussion of general and theoretical influences for this study including the ‘Place Model’ and ‘Space Syntax,’ and how they could be applied to the study of the traditional Thai home that exploration of architectural, social and symbolic significance.

#### ***Naturalistic inquiry and ethnography***

The reviews in the preceding chapters indicate a lacking of an integrated framework to construct a holistic understanding between human and their built setting—what Carsten and Hugh Jones (1995) express as the ability to see the ‘house in the round.’ Anthropology embraces an interplay between human and culture including knowledge, values, and traditional ways of viewing the world, which have been transmitted from one generation ahead to the next. Rubbo (1979) notes that architecture ceases to exist as ‘a thing in itself’ become part of a cultural totality when view under the anthropological frameworks. The anthropological framework could serve as a powerful and encompassing tool to be used the investigation the relationship between the human and built setting.

Ethnography is rooted in Anthropology. According to Geertz (1993) the ethnographic study of cultural systems is performed by building up details of cultural life as thick description. Although ethnography is primarily used to study culture, it also proves useful for the socio-cultural study of the architectural setting {Devakula, 1999;

Karnchanaporn, 2003-2004; Sparkes, 2003; Charernsupkul, 1978; Jumsai, 1975; Jumsai, 1986; Jumsai, 1997; Duangwiset, 1996).

Ethnographic data collection includes direct observation of environmental behavior and physical traces. This approach generates a large and broad range of data. Ethnographic data can then be analyzed through ‘content analysis’ or various interpretive frameworks such ‘semiology,’ ‘hermeneutics’ or ‘psychological interpretation’ {Cooper Marcus, 1997; Korosec-Serfaty, 1984; Karnchanaporn, 2003-2004; Jumsai, 1997; Sparkes, 2005).

The first architectural research study to connect the traditional Thai architectural form with the evolution of the cultural core was performed by Jumsai’s (1975). His research adopted an ethnographic approach that combined diverse data sources to investigate the origin of the West Pacific architecture. He concludes that the form and symbols presented in architectural features of traditional Thai house and the Austronesian houses are attributable to nautical architecture and the natives’ intertwined history with their physical environment. Jumsai’s research may serve as a useful prototype for development of a contemporary research program aimed at investigating socio-cultural dimensions that influence Thai vernacular architectural.

Over two decades after Jumsai’s (1975) first publication, interest in the socio-cultural dimension of the traditional dwelling has been revived in the architectural research community. Devakula (1999) applies the ‘participant observation’ approach to explore an experiential aspect common to four traditional and contemporary Thai Houses, while Karnchanaporn (2003-2004) employs similar techniques to investigate how Thai people in their dwellings deal with the chaos and uncertainty of contemporary urban life. In the same light, a study by Yimsrual (2007) employs ethnography to explain why Thai people regard the home as an auspicious domain. Another ethnographic study of the Northeastern Thai house, by Sparkes (2005), investigates the relationship between gender and the cosmology of its residents.

Ethnography serves as a useful tool for data collection in the socio-cultural studies of architectural setting. This is due to its sensitivity to meaning and capacity for detecting the holistic view of the real life circumstances (Groat & Wang, 2002). The prolonged contact permits the researcher to collect other socio-cultural information

embedded in the physical setting and the detail information of people's daily life that cannot be simulated in any artificial environment (Zeisel, 1981). This information not only serves to enrich the data interpretation, but also enhances the researcher's understanding of the occupants world view toward their relationship with the built setting.

However, the researcher's prolonged contact with research subjects may have some drawbacks as it may interfere with the behavior of the research subjects and result in observation bias. In addition, the issue of 'self projection', where the accounts recorded during fieldwork are derived from aspect of the personality of the author, could jeopardize the credibility of the data (Davies, 2002; Groat, 2002). To avoid these limitations, the researcher must consider the following criteria for determining data quality namely credibility, transferability, dependability, and confirmability (Guba, 1981a, 1998).

### ***Archival records***

Archival records can be used to corroborate data from field interviews and direct observation or to investigate topics that are otherwise out of reach by direct observation or interview. Several types of archival records may be used as secondary data sources for environment-behavior or architectural research (Zeisel, 2006; Groat, 2002). Suitable types of archival records that may be used include text, numeric data, and nonverbal representations (Loizos, 2000).

Examples of the use of archival records for architectural research can be found in the studies conducted by Lara (2001), Jumsai (1975), and Thippathat (2002). In an architectural research study of popular Modernism in Brazil, Lara (2001) effectively incorporated divergent forms of archival information such as magazine advertisements, house plans, and so forth as historical evidence to produce a new and provocative interpretation of Brazil's adoption of Modernism during the 1950s. In the same light, Jumsai (1975) draws on various sources of archival evidence including a variety of maps, cosmological diagrams, mural paintings, and plates from missionary chronicles to support his theory on the origin of Western Pacific architectural forms.

Mural paintings can serve as a valuable form of archival data. As painted images they can be of special interest to the researcher whose interests relate to architecture, history, or religion. Murals along with graffiti act as documents that may preserve a record of a society's social codes and social conduct. Although information from a painting may not be read in the same manner as with a photograph, several researchers have shown that the elaborately painted images that adorn Thai temples often depict scenes that convey wider meanings hidden within. For example, Thippathat (2002) quite effectively uses temple murals to study the 200 years of foreign influences on the architectural feature of the Thai houses in Bangkok.

Archival data are considered very practical and often used as a main data source for historical and contemporary research. Sometimes archival records may be the only source of information, particularly when the topic is historical and unavailable for direct observation or interview (Zeisel, 2006). However, archival records are a secondary data source and are subject to uncontrolled bias originating from the perspective of the individual who created them. In addition, some archival information may require at least partially subjective interpretation by the researcher (Wang, 2002; Zeisel, 1981). Apart from the 'self projection bias', differing cultural background and perceptions of the original data collector and the researcher may impose potential bias toward data interpretation. The researcher must be aware of such pitfalls, and employ Guba's criteria (1981) to evaluate data quality.

Ethnography and archival research have been widely used as tools for architectural research that has a socio-cultural emphasis. Participant observation and a long-exposure to the culture being studied permits an understanding of human cultures from the subjects' point of view (Groat, 2002). When carefully designed and carried out, the combination of ethnography and archival research provide valuable tools for gaining insight into the socio-cultural dimension of the built environment.

### ***Structuralist approach***

Structuralism shows that the influence of the socio-historical world upon members of the communities and their built environment (Shalvey, 1979). As Durkhiem and Swain (1976) put "[a] concept is not my concept; I hold it in common with other

men.” A similar expression of this denial stems from the application of the insights, primarily from the Freudian idea of the unconscious but also from Marx's notion of praxis.

The chief proponent of Structuralism is the social anthropologist Claude Lévi-Strauss (Shalvey, 1979). Structuralism shares with Marx, Jung and Freud the concept that all humans have a common physical heritage and predisposition towards specific physical forms—this is exemplified by Jung as the collective unconscious. The collective unconscious could be thought of as the genetic blueprint of the human psyche that exists across cultures and in individuals, and can be revealed in language and cultural practices such as folktales, literary texts and architecture (Shalvey, 1979).

However, structuralism values the deep structures over surface phenomena. It parallels, in part, the views of Marx and Freud that are concerned with underlying causes, unconscious motivations, and trans-personal forces, rather than the individual consciousness and choice (Milner, 2002). In Lévi-Strauss, this radical turning-to-the-world to find the structures of mind lies in what, generally, he has called his "everyday materialism"

Adopting this notion of a social phenomenon as part of a totality, Marcel Mauss, the father of modern ethnology, adds to it the important conception of the role of exchanges-economic, matrimonial, and religious--in forming the collective unconscious (Shalvey, 1979). For Mauss, every social institution reveals the same psychological, intersubjective pattern. For Marx, social existence determines the individual consciousness, and not vice versa: "Does it require deep intuition to comprehend that man's ideas, views and conceptions, in one word, man's consciousness changes with every change in the conditions of his material existence, in his social relations and in his social life?" It follows that the superstructures of society (such as political life, art, and architecture) are built upon the economic structure of society; thus it is not the consciousness of men that determines their being but their social being that determines their consciousness (Shalvey, 1979).

The study of the vernacular house and culture are plainly and inextricably linked to the community in which they occur, and can be understood by adopting a Structuralist approach. Structuralism can be defined as an approach to the study of human culture

centered on the search for constraining patterns, or structures, which claimed that individual phenomena have meaning by virtue of their relation to other phenomena as elements within a systematic structure (Milner, 2002). The most important proponent of Structuralism, Lévi-Strauss described a house as made up of both the material and immaterial components that are dialectically inter-related. He further proposes that the unconscious mental structures of the human mind are capable of generating social and symbolic forms that become objectified in the material components of the house.

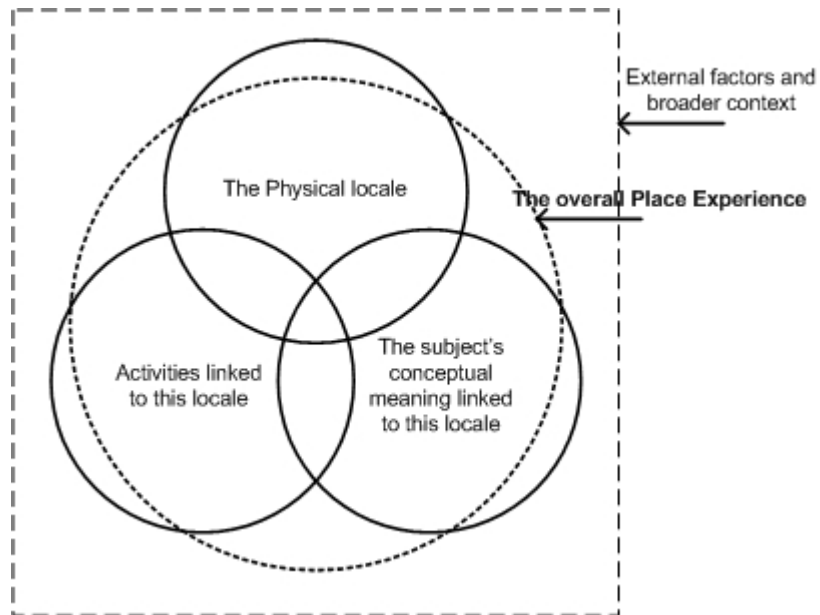
### ***Interpretive frameworks***

The following section discusses three major frameworks, which originate from the Structuralist school of thought that will be used in interpreting the data for this study. These three frameworks include Place Model (Canter, 1979), Space Syntax (Hillier & Hanson, 1984), and Semiotic. Though they are grounded on the premise that social meaning can also be retrieved from the externalized products, these three approaches differ in the application and the focuses. Description and critical analysis of each approach is presented in the following order of its application and influences to this study.

### **The Place Model**

The overarching concept used to guide this research is derived from Canter's Place Model (Canter, 1997). This model defines the overall sense of place as tripartite union of the physical locale, the activities linked to the locale, and the subject's conceptual meaning linked to this locale. (See: Figure 25).

The Place Model also emanates from the Structuralist school of thought as it seeks to understand the underlying pattern—the interrelation between factors that constitute place experience. In a review of the value of this model, Groat (2005) observes that the overall sense of place results from the interplay between these inseparable domains; the physical locale, the activities linked to this locale, and the subject's conceptual meaning linked to this locale. Alteration in a single domain may have caused the changes in the overall quality of the experience of a place.



**Figure 25: A Modified from diagram of Canter's "Place Model" (1997)**

Canter's Place Model provides an inclusive framework for both research design and the professional practice of design. For the research design application, the Place Model recognizes the importance of the dynamic between all three domains as it constantly reminds the researcher that the place does not exist as an isolate entity, but in the multiple connections between the built setting and people it contains. It is a valuable tool to be used in framing the research questions, research design, or categorize the research focuses (See: Chapter 3).

## **Space Syntax**

Similar to the Place Model (Canter, 1997), Space Syntax, also rooted in the Structuralist approach, is one of the tools to describe the characteristic and relationship of spatial organization of the architectural setting or settlement. The main differences lie in their focuses and the application. In term of focus, when comparing with the Place Model which equally address the importance of the three constituents, Space Syntax singles out on the two of the constituents—the activities, and the physical attributes (Groat, 2009).

Space Syntax is both a theory and method, and is first developed by Hillier and Hanson (1984) on two premises; the first premise assumes that there is such a thing as the

social aspect of space, which implies that the society needs space to express itself; the second entails that the understanding on the social aspect of space that can be described by mathematical computation.

The Space Syntax theory posits that when perceiving space as composed of discrete entities, the social structure of the inhabitants is dependent on how these discrete entities are connected, and related to the overall system. Space Syntax method focuses on an exploration syntactic codes that involves spatial types, and offers a sensitive tool for description of forms and illustrates their efficacy in explaining the causes of built form.

The study of space syntax, along with other approaches such architectural semiology have been applied to the study of socio-cultural dimension of the house, complex buildings, and city planning with at least some degree of success (Lara, 2001; Guney, 2005; Hillier, 1986; Bafna, 2001; Hanson, 1998).

In a study of space and gender in traditional French farmhouses in Normandy, Hillier and colleague (1986) use a simple space syntax techniques to examine the concept of *lateralité*<sup>2</sup>—the male-oriented spatial arrangement proposed by Cuisenier (1991). Interestingly, space syntax analyses uncover the inherent female-centered view and the male-centered view of the house within the underlying *lateralité* concept. The female-centered house layout organized spaces around the *salle commune* (everyday living and cooking space), and the alternative inherent structure is where the space is organized around the vestibule (entrance hall). The spatial organization of this female-oriented house type presents a strong integration of space for everyday living and permissive relation to the outside world whereas the transition space of the vestibule serves to segregate control of the domestic world to the outside.

Recent research by Guney (2005) uses space syntax analysis to reveal the impact of social changes on the evolution of spatial morphology within Turkish homes in Ankara. Her findings, from the syntactic analyses of the exemplary house plans, further confirm the cultural transition indicated in the Turkish historical records. With similar

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<sup>2</sup> According to Hillier and colleague (1986), the *lateralité* concept refers to the functional arrangement of the space with three distinctive characteristics; it has a geometrical left-right element; it is organized around a central transition space; it is also based on the point of view of the male master of the house.



interests in spatial morphology and the evolution of built form, Bafna (2001) studies Mies van der Rohe's residential designs development focusing on his early career in Germany during 1907-1938. The syntactic analysis allows Bafna to examine chronological development of Mies's design ideas, and enable him to provide explanatory themes of unified aesthetic and sociological concerns.

Geertz (1993) points out that culture is a control mechanism. It carries information and can be thought of as analogous to a blueprint of social conduct that directs how behaviors, information and artifacts are to be transmitted. As such, cultural information can be transmitted through various artifacts including the built environment (Bonner, 1980; Wobst, 1977; Rapoport, 1982a; Moore, 1983; Hodder, 1982). Spatial variables, of interest to space syntax study, such as 'connectivity (CV)', 'relative numbers of ring (RR)', or 'integration value' can be used to quantitatively depict the control or accessibility to the space.

Sometimes the appearance of a built setting can be deceptive, and the spatial relation which regulates the occupants' interaction can be perceived in a different light. Space syntax analysis can be used to reveal the underlying social control mechanism inherent in the spatial arrangement (genotype) which can apparently be quite different from the appearance or style of the actual house (phenotype). For example, Lara (2001) finds that the traditional spatial control used by the Brazilian families to regulate access to the daughter's bedroom within houses having a Modern façade.

The space syntax analytical techniques emphasize quantitative modeling to uncover the sociological and behavioral aspects of formal characteristics as well as spatial arrangement of the built setting. Pearson and Colin (1997) criticize that the unit of analysis in space syntax analysis are often viewed solely in two dimensions. But in reality, the two-dimensional experience of space is considered appropriate since there are inherent subjectivity of political construction and other socio-cultural dimensions of space that must be taken into account (Pearson & Colin, 1997). When not juxtaposing with the social meaning, space syntax analysis alone may serve to treat the social space with a contrived objectivity, and reduce architecture to a descriptive and definitional level.

To counteract the aforementioned shortcomings of space syntax analysis, the study of syntax and semantics should be pursued jointly so that it encompasses information on the meaning and use of specific spaces. In determining the social implication of house and its spatial organization, researchers invariably uses quantitative and statistical analysis to uncover patterns of spatial 'genotype' in the built setting (Hanson, 1976; Hanson, 1994; Hanson, 1998; Hillier, 1986; Johnson, 1997; Nevett, 1997; Orhun, 1995; Plimpton, 1987; Bafna, 2001; Guney, 2005). Their research findings confirm that cultural ideas that exist in the mind may also be objectified in physical artifacts, and research may be most powerful when it links the study of meaning with context.

## **Semiology**

Semiology, or the study of signs and symbols within society, sought to transcend the limitation of the individual subjective interpretation of phenomenology by grounding analysis in universal systems that describe the underlying relationships among components of the structure (Leach, 1997). When compared to Hermeneutics, semiology is deeply concerned with non-linguistic signifiers while hermeneutics pays more attention to natural languages in general (Robey, 1973).

Pearson and Richards (1997) suggest that architecture can be conceptualized as a symbolic technology. The symbol system inherent in the built form, like other aspects of culture, is used for transmitting various forms of information (Rapoport, 2000). The messages conveyed by a symbol may be linked to natural, emotional or socio-cultural meanings (Davies, 2002). Accordingly, Csikszentmihalyi and Rochberg-Halton (1981) observe that the envelope of architectural structure is not just a metaphor, but it is a symbolic projection of the creators' essence to shelter their own personality. Thus, architecture can be interpreted through a semiotics framework, which is a systematic way to classify signs and sign systems in relation to the way they are transmitted.

Semiology serves as a useful tool for acquiring the inherent meaning of the built setting since it does not focus only on the architectural elements or the language per se. The fact that it also considers other non-linguistic elements permits the researcher to take a broader range of sign systems into account. Aside from the built setting itself,

semiology can be used to analyze archival information and other nonverbal material served as evaluative or corroborating evidence in the cultural study. Other nonverbal materials suitable for semiotic analysis may include photographs, icons, magazines advertisements, mural paintings and so forth.

The flexible application of semiology allows several researchers (Karnchanaporn, 2003-2004; Sparkes, 2005; Thipphathat, 2002; Wyatt, 2004; Brereton, 2006) to effectively interpret signs or symbols that represent the cultural ideas that are projected in the Thai architectural artifacts.



**Figure 26: Naga serpent as the parade floating in Thailand**  
[Source: image52.webshots.com]

Jumsai's (1975) postulates an overarching theory—'water as the origin of West Pacific indigenous architecture' based on the observation of a wide range of underlying aquatic attributes evident in ritual, literature, dancing, folk art, painting, sculpture, architecture, or even in town planning of the West Pacific civilizations. By the same token, Sparkes' (2005) interpretation of various spirits and their attributes such as, 'Lord of the land', 'Naga' (see: Figure 26), 'Lady of the woods', and 'Mother Earth', symbolize the complementary role of gender in labor division within the household.

In the study “Domesticating the Chaos,” (Karnchanaporn, 2003-2004), the researcher explores how Thai people maintain their social order and make sense of the chaos of everyday life by creating an orderly domestic space or symbolic universe in their home. According to the study, a symbolic universe, in a shrine within the home, is represented by the arrangement of Buddha’s image and other god or goddess icons of the Spirit religion.

Semiology augments the possibility of studying the hidden dimension within the physical structure as well as other cultural artifacts such as the temple murals. The study and interpretation of murals is also amenable to the semiotic tradition.



**Figure 27: Mural painting from the exterior wall of an ordination hall of the temple in Northeastern Thailand**  
[Source: Brereton (2006)]

Brereton (2007) interprets many aspects of Thai life, the history and the religion from the temple mural in the Northeast region. By the same token, Wyatt (2004) interprets the sentiment of the local Thai toward the foreigners from the painting of the temple from several regions of Thailand. The analysis of temple murals by Wyatt (2004) indicates that tri-colors are used specifically for depicting political backgrounds as an expression of anti-French sentiment.

In short, semiology has been applied to a range of sign systems, including architecture, and images of all kinds. It serves to enhance the understanding of meaning, beyond the subjective individual interpretation, onto the cultural use of codes and signs recognized by the collective in the given society.

### **Summary**

From a Structuralism point of view, the house is a microcosm of the symbolic relation to which the occupants' daily life and rituals are projected. Thus, we can learn the changes that occur to the immaterial components of the house, as well as the social construct of the dwellers, by reading into the pattern of transformation of the houses' material components, the spatial organization, and the external social product of the collective such as mural paintings.

With an attempt to understand the domestic life of the Central Thai farmer in a holistic view, the Place Model provides an initial framework and influences the research design for this study. The research design (which will be discussed in detail in the following chapter) simultaneously explore the three constituents that make up the place experience; the activities (how the livelihood, the lifestyle), the meaning (the family life and cultural value), and the physical attributes of the home.

Semiology and Space Syntax can be used as complementary interpretative framework for ethnographic and naturalistic inquiry. When combined the broad range of systematic decoding of cultural meaning inherent in the sign and symbols of artifacts serves not only to augment our understanding of multidimensional social reality, but can also be used to counteract the self imposed bias and complications resulting from the iterative process of qualitative data interpretation.

## Chapter Six

### Research design

This chapter presents the research design adopted to investigate the primary study question: “how have the place experience including the physical characteristics of the traditional houses in the Central region of Thailand been transformed in response to changing socio-cultural environment?”

First, the rationale for selecting a research design and data collection methods are discussed. Included in this chapter the research site, the Baan Krang Subdistrict, is described including demographic information for the two groups of the interviewees—the house occupants, and the master house builders. This chapter then provides the plan for executing research, data collection, data reduction and analyses are discussed.

#### ***A single-case study design with mixed methods***

This study explores the cultural dimension of the traditional home of Central Thailand. Of special interest is the interplay between social change and the experiential quality of the home. It aims to use the three constituents of Place Model as a framework for understanding the place experience in the traditional Thai house, and to explore how have the experience been transformed over time. The following table shows the particular issues to be investigated within each domain.

**Table 5: Framework for a research design on the transformation of place experience in the traditional Thai house**

<b>Domains</b>	<b>Issues</b>
<b>Activities</b>	Explore the transformation in the farmer’s spatial behavior and activities within the house.
<b>Conceptual meaning</b>	Explore the transformation of the cultural value and experienced meaning of the farmers.
<b>Physical characteristics</b>	Explore the transformation of the overall attributes (the exterior) as well as the spatial organization (the interior), and the architectural details of the houses.

The relationship displayed in the table are not mutually exclusive, but overlapping and constantly imposing upon each other. Given the interrelated complexity of the multiple phenomena touched on by the research question, the use of a mixed method approach enables a through investigation even with the single-case design.

***Criteria for site selection and sampling technique***

This study adopts a combination of convenience sampling, snowball sampling, and theoretical sampling techniques (Auerbach & Silverstein, 2003) to guide selection of appropriate data sources and the number of samples required.

This ‘Baan Krang’ community was chosen as the preferred setting for data collection after comparing with two other farming communities in Suphan Buri and the nearby province of Ayutthaya (one in Bang Pla-Ma and another in Bang-Sai). The Baan Krang community proved preferable for conducting this study because of (1) the high concentration of traditional Thai houses and the availability of family members for survey and interview, (2) the uniformity of its demographical characteristics such as ethnic group and occupations, and (3) most importantly, the availability of an informant who is regarded as a respectable member of the community that served as liaison and champion for gaining participation of a large sample size.

Sample selection was initially determined by an informant provided that the sample must meet the criteria given by the researcher. Referrals of samples were then further supplied by many interview participants who were typically proud of their heritage, and gladly encouraged the researcher to learn more about their domestic life.

During the data collection process, the content of information collected started to become repetitive after completing half of the overall sample. However, the researcher decided to continue to collect information until 15 family houses were reached to be certain not to overlook anything.

### **The case context: Baan Krang**

Baan Krang subdistrict (tambol) is located in Si Prachan district (amphoe), the eastern part of 'Suphanburi' province (changwad) of the Central Thailand. Baan Krang is comprised of 6 villages and has a total area of 2,280 hectare, which consists of 1,896 hectares of irrigated farm holdings operated by 1,086 families (Department of Agriculture, 2008). In 2008, the population density of Baan Krang was 4.93 persons per hectares (12.18 persons per acres).

Baan Krang is a part of the Chao Phraya Basin. It is an immensely fertile region made up of sedimentary deposits from the Tertiary and Quaternary periods (Coutsoukis, 2004). The relatively flat unchanging landscape of the Central region facilitated an inland complex of water irrigation and road transport.

The community is approximately a 2.5 hour drive or about 125 kilometers away from Bangkok, the capital city of Thailand. The community can be accessed via two routes. The first and almost obsolete means is by boats on the Tha-chin River. However, today's choice favors more efficient access through the major highway network that was built less than ten years ago. National highway number 340 is also used for transportation of agricultural products in and out of the community.

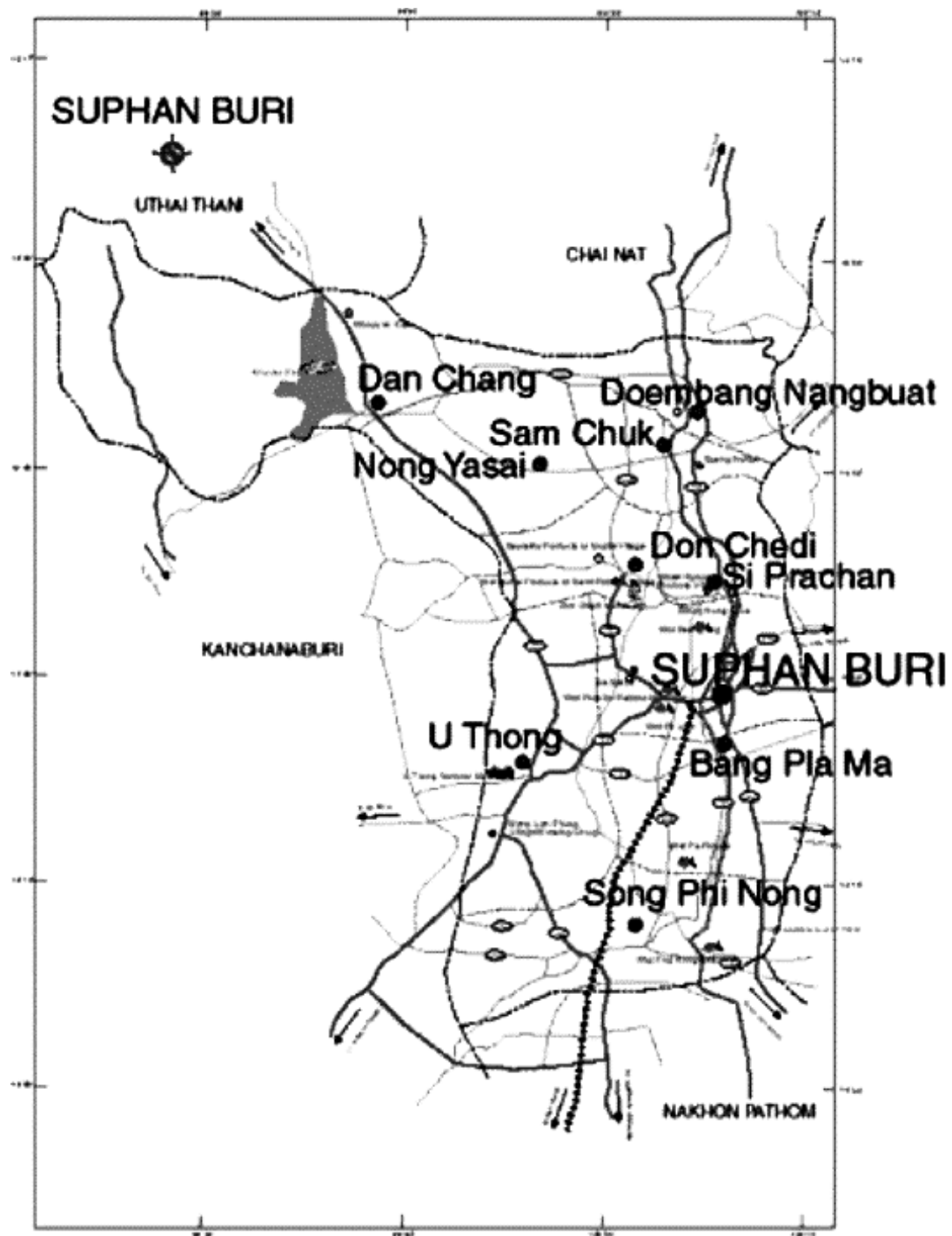
As with most of the Central region, Baan Krang is located in the large alluvial plain outside the typhoon belts, and has a tropical wet, and dry or savanna climate with three distinct seasons: rainy, from June to October; cool, from November to February; and hot with cloudless days and the highest temperatures from March to May. The temperatures normally range from an average annual high of 38 °C (100 °F) to a low of 19 °C (66 °F) with an average humidity of 82 percent. The average rainfall in these regions is 1,250 cm. per year (United Nation, 2008), which makes it suitable for wet-rice cultivation.



Rice farming is the major occupation of the Ban Krang people, and occupies over 95 percent of the total arable land in the area. The rest of the population obtains extra income from other agricultural related occupations such as small-scale fisheries, livestock, and occasionally other off-farm income.



**Map 2: Map of Thailand showing Suphanburi province in the circled area**  
 [Source: [www.weltkarte.com](http://www.weltkarte.com)]



Map 3: Map of Suphanburi showing all districts in the province  
 [www2.tat.or.th]

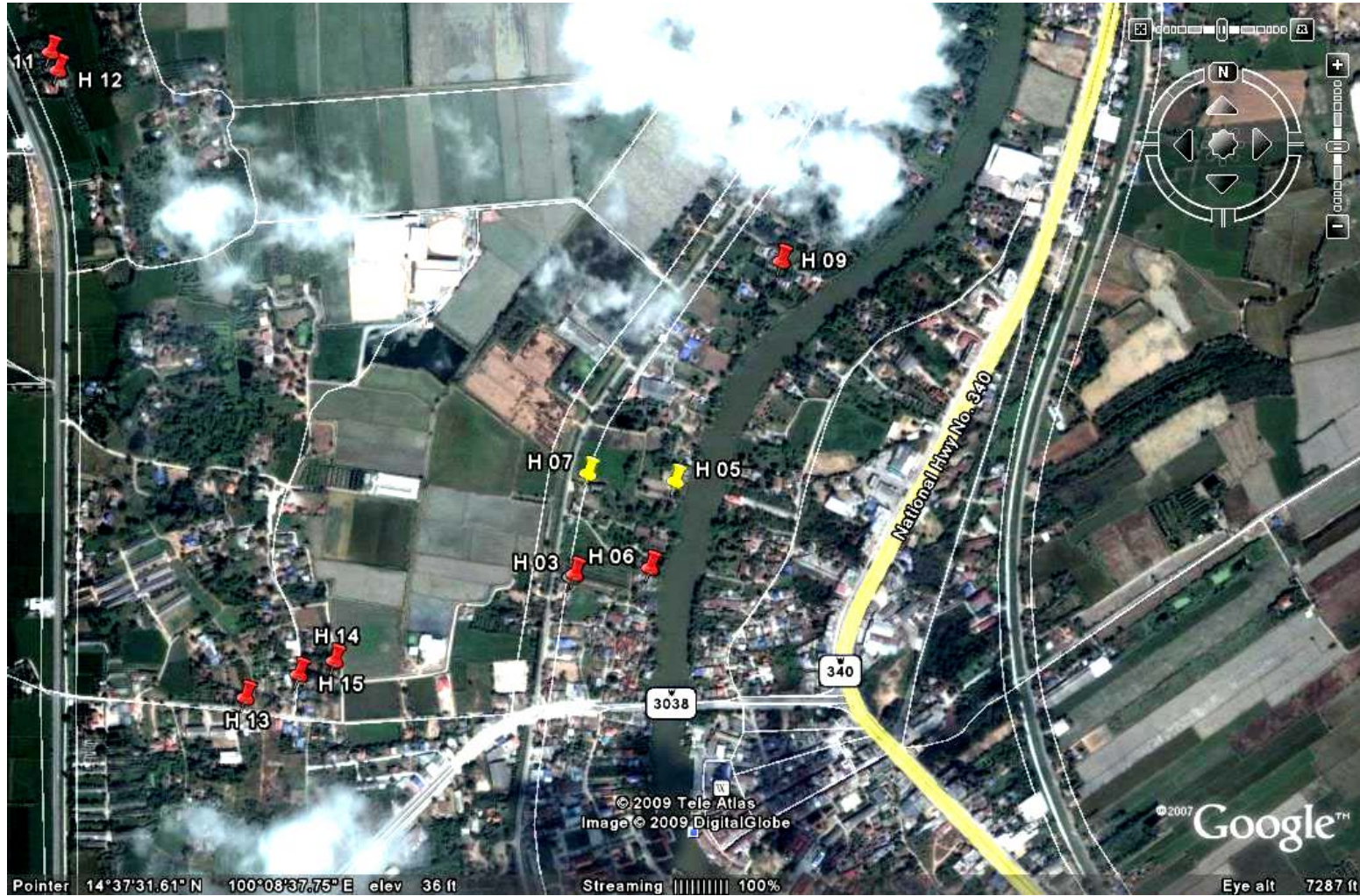


Figure 28: Sattellite picture of Baan Krang subdistrict showing the location of some the houses in this study [Source: Google Earth]

## Settlement Characteristics

The residents of Baan Krang benefit from the ‘Tha Chin’ River that runs through the area. The river serves as the principal water supply for daily use as well as agriculture. The Tha-chin, also known as Suphan River, is a tributary of the Chao Phraya River. It drains and fertilizes a total area of 13,681 square kilometer of rich paddy land in the Chao Phraya Watershed.



**Figure 29: View of the Tha-Chin River**

The Baan Krang community has well enjoyed the benefit of this fertile soil, as it is known as one of the most productive rice farming communities in the area. Daily life and settlement preferences of the people of Baan Krang in the past were closely tied to this river.

Historically, the rice farmers’ houses in Baan Krang can be described as the river cluster type. A large number of relatives built their houses closely together on both banks of the Tha-chin River. At present, the density of the settlement along the river is much lower than in the past. With the network of irrigation canals, and improved transportation system, which was the result of the 1978 “Land Consolidation Act,” farmers have

gradually relocated their houses away from the riverside to the larger farm holdings further inland. In so doing, some farmers built the houses while some relocated old houses from the river to create the homestead settlement type.

Along the Tha-chin River are located temples. These are ‘Wat Don Bhuppharam,’ and ‘Wat Baan Krang.’ In the past these temples also functioned as educational centers, but at present they include special quarters and facilities reserved for monks, a building for public worship and religious ceremony, and a community meeting place.

The temple was also the locus both Buddhism and Spirit Religion activities. Although the Spirit Religion ceremonial rites are outside the canon of Buddhism, they are important to the community and are often carried out by monks. The Farmers usually go to a monk versed in these matters to learn of propitious days for certain undertakings such as weddings or to be cured of certain illnesses by the application of holy water (LePoer, 1987; Terweil, 1994).

### ***The data collection: Mixed methods***

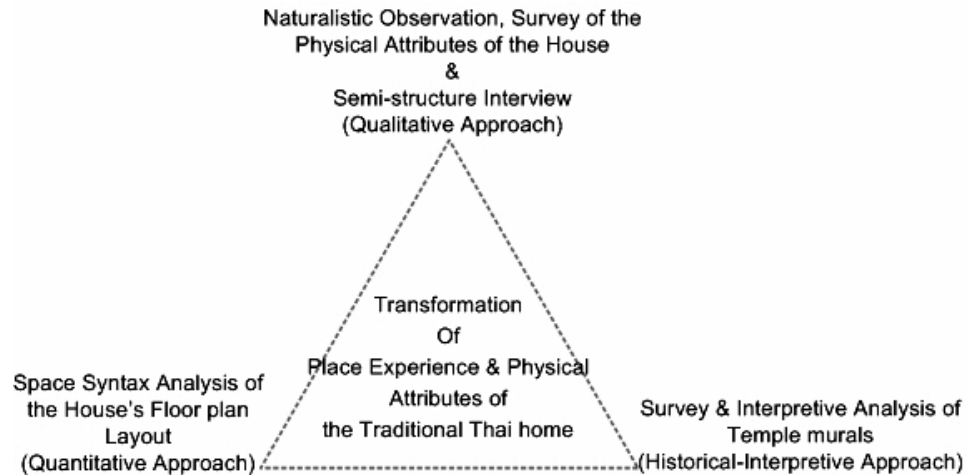
This study aims to simultaneously explore the three constituents that make up the place experience, which including the activities (the livelihood, the lifestyle), the meaning (the family life and cultural value), and the physical attributes of the home, which requires multiple factors to be examined. (Table 6)

As the domain of Place Experience comprises of distinctive issues, some of the issues concern different data sources. Therefore multiple data collection methods are required to address each sub question.

In addition, use of a combination of multiple independent data analysis methods and interpretative lenses with different strengths and weaknesses, will minimize the problems that result from use of a single approach (Cresswell, 2003), and permits a broader perspective for the phenomenon of interest. As Mathison (1988) and Cresswell (2003) concur that employing multiple methods in the analysis of the same empirical event, each method adds another layer of detail revealing a different dimension of the empirical reality.

**Table 6: Development of the research design driven by “Place Model” framework**

Temporality	Methods	Place Experience		
		Activities	Conceptual Meaning	Physical Characteristics
<b>Historical</b>	(a) Reconstruction of historic homes from oral accounts			✓
	(b) House design & domestic life in temple murals	✓		✓
	(c) Archival records			✓
<b>Historical &amp; Contemporary</b>	(d) Interviews of house occupants and master house builders	✓	✓	✓
	(e) Review of existing research	✓		✓
	(f) Space Syntax	✓		✓
<b>Contemporary</b>	(g) Direct observation	✓	✓	✓
	(h) Artifactual documentation of the actual house			✓



**Figure 30: Triangulation of the research design methods**

As shown in Table 6, various data collection approaches are used to gather information that address inquiries from each domain, which make up the ‘place experience’ in the traditional Thai farmer’s home. The data collection approaches include the semi-structured interview, artifactual documentation of the house floor plan, direct observation, and survey of the temple murals, which are by and large qualitative in nature.

### **The semi-structured interview**

The interviews serve as the primary source of data for such aspects as the history of the house, daily activities, occupants’ perceptions of their homes, and historical and contemporary social changes that may have a direct bearing upon the research question. Both groups of interviewees participated in this process—the house occupants, and the master house builders. Each interview sessions are recorded by the video camera by the researcher, and later transcribed into the native language (Thai), and then coded for content analysis and patterns by using the qualitative analysis software NVIVO 8.

### **Interview of the house occupants**

A semi-structured interview provided information on both current and historical aspects domestic life experience of the Central Thai farmers. The information from the interviews were used to triangulate with the data from direct observation, artifactual documentation of the house, and survey of mural paintings to explore the impact of these

constructs on the domestic life of the Central Thai farmer and to explain how it has changed over time.

### ***Interview methods***

For each visit, the researcher was led into the house by an informant. The informant then explained to the family members the reasons they are being interviewed, and asked for their consent to participate in the study. In most cases, the informant left the researcher alone with the interviewee after he or she consented to participate in the study. The interviewees were also asked permission to videotape the interview.

The entire interview was conducted in the Thai language. The interview script was first prepared and revised in English by using the framework illustrated in the literature review section (which were presented in the original proposal), and then translated into Thai. There scripts contained 32 questions divided into three parts: (1) demographic information, (2) gender role, (3) cosmological belief, and (4) social changes (Appendix A). The duration of interviews varied from 90 to 150 minutes depending on how much information each family had to share.

Most of the interviews could be considered group interviews with the elderly being the primary interview respondents. In most cases, there was at least one younger family member who assisted the elderly in providing answers to questions.

**Table 7: Number of interviewees in each session**

<b>Category</b>	<b>Sessions</b>	<b>(%)</b>
<b>Number of interview participant in each session</b>		
1	5	(33)
2	5	(33)
3	5	(33)

Average Interview Participant in Each Session = 2

Number of Family Interviewed (N) = 15

Total Number of Interview Participants = 30

### ***Profile of the house occupants***

The Baan Krang residents describe themselves as the authentic Thai. Elderly interview samples attribute their ancestry as native peoples of Suphan Buri. The



community's infusion with other ethnic Tais or intermarriage with Chinese immigrants was quite rare. This might be due to fact that conservative Thai Labor Law reserves rice farming strictly for Thai citizens. As such, as some interview participants pointed out, it proved very difficult for Chinese immigrants to relocate and make a living in a rice farming communities such as this one.

All of the interviewees speak native Thai language with the distinctive 'Suphan Buri' accent, which they claim is the genuine spoken Thai. As with the rest of Thais, the formal religion of all Baan Krang residents is Buddhism. Yet, evidence from direct observation showed that Spirit religion is overtly practiced side-by-side with Buddhism.

The age range of primary interview respondents is from 46 to 89 years, with the average age of 72 years. Out of these 15 families, 9 of the primary interview respondents are married, while the rest are either widows or widowers.

The size of the family in this study ranges from 1 to 5 household members with 2-4 members in most of the homes, and half of the families interviewed have 3 generations under one roof. This is not a very large family size at all considering it is in a farming community. Many elderly interviewees indicated that they have several children, but many of them relocated to urban areas to engage in occupations besides farming. A few indicated that their children relocated to other countries.

**Table 8: Number of children of interviewees**

Category	n	(%)
<b>Number of Children of the interviewee</b>		
1-3	9	60
4-6	4	27
7-9	2	13

Total Number of Family = 15

**Table 9: Interviewee's age group**

Category	n	(%)
<b>Age of Primary Interview Participant</b>		
40-49	1	(7)
50-59	1	(7)
60-69	2	(13)
70-79	6	(40)
80-89	5	(33)

Total Number of Interview Participants = 30

Number of Family Interviewed (N) = 15

The primary interview respondents have been living in their current residences on average for just over 55 years. Twelve out of 15 of the families (80 percent) in this study live in the houses that were inherited from ancestors, and the other 3 families (20 percent) had purchased their home from relatives or neighbors before relocating to the current sites.

### **Interview with the master builders**

Another group of informants in this study were the master house builders. The interview script designed for the master builders of traditional Thai homes was developed after the initial data analysis of the interviews with house occupants and the survey of temple murals were completed.

The main objective of the master builder interview was to gather corroborating evidence for the reconstruction of both past and present experience of domestic life of the Central Thai farmers. The general inquiries in the interview touched on the issues of cosmological beliefs, and social changes, with particular emphasis placed in this part of the data collection on the ritual and ceremony involved in house building as well as the change of preferences for traditional house forms (Appendix A).

### ***Interview methods***

Similar to the data collection with the homes' occupants, a semi-structured interview approach was used for soliciting information from the master house builders. The information of interest includes past and present experience of domestic life among Central Thai farmers, as well as how the house form and its construction ritual has changed overtime.

This information set was collected from 5 master builders, and 2 master carpenters of traditional Thai houses. The selection of the builders to be interviewed was based on convenience sampling from the largest and most well known community of traditional Thai house builders, which is in Bang Pa-Han district of Ayutthaya province as indicated in the survey by Pongmethakul and colleagues (2002). Near this community is a cluster of approximately 10 workshops of commercial builders along a major highway, which is a major route from the central to the northern region of Thailand. This

is the only area of the Central region where one can still find builders of the traditional Thai house.

For each interview, the researcher visited the traditional Thai house builders' area in Bang Pa-Han, and approached the Master builders of each workshop for an interview and photographing. The procedure for interviewing the master builders was similar to that for the house occupants. Prior to each interview, the informant (Master builder) received information about the research and was asked for their consent to participate in the study.

Interviews were conducted in the Thai language and videotaped. The interview was a one-on-one session that followed 20 open-ended questions in the prepared script. During and after the interview, the informants were free to interject their life story and experience or show their work to the researcher. The length of each session varied depending on the availability of individual informants.

The semi-structured interview script was divided into 2 major sections including 1) demographic, and general information, and 2) questions pertaining to the construction of the traditional house, gender roles, cosmological belief, and social change.

These questions in the script were formulated after the preliminary analysis of the data collected for the dominant research design in order to gain an in-depth understanding from the perspective of the other party involved in house design and construction.

### ***Profile of the master builders***

Five master builders and two master carpenters of the traditional Thai house, with age group ranging from 45 to 71 years old, participated as the informants in this part of the study. These male informants are native residents of Ayutthaya province, and have had from 20 to just over 60 years of experience in constructing traditional Thai houses. Two out of the five informants, who had the most experience, inherited their house building knowledge and practices from the previous generation while the rest gradually transitioned into the trade as builders or carpenters.



**Figure 31: Photographs taken from several master builders shops in Ayutthaya province**

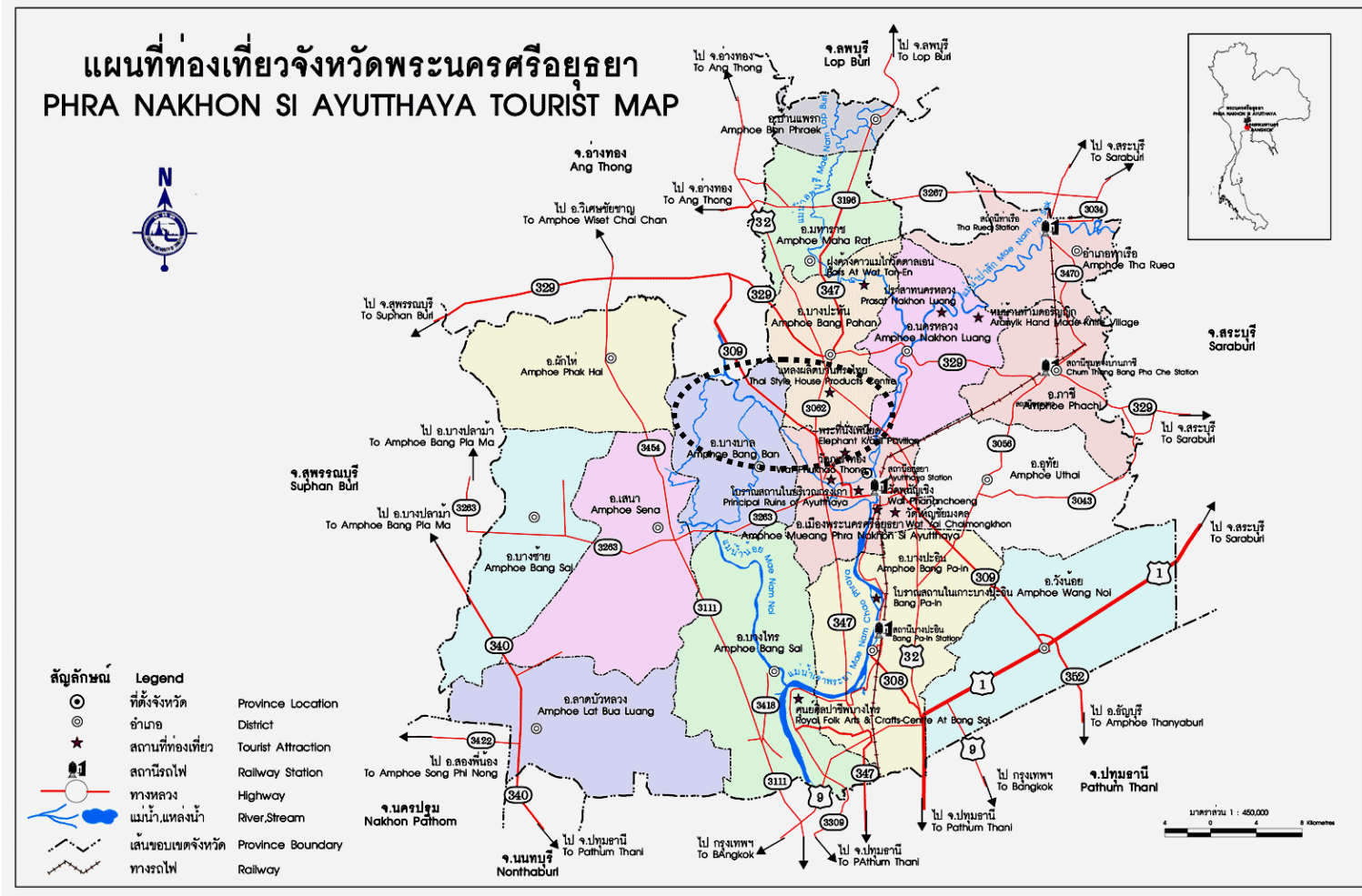
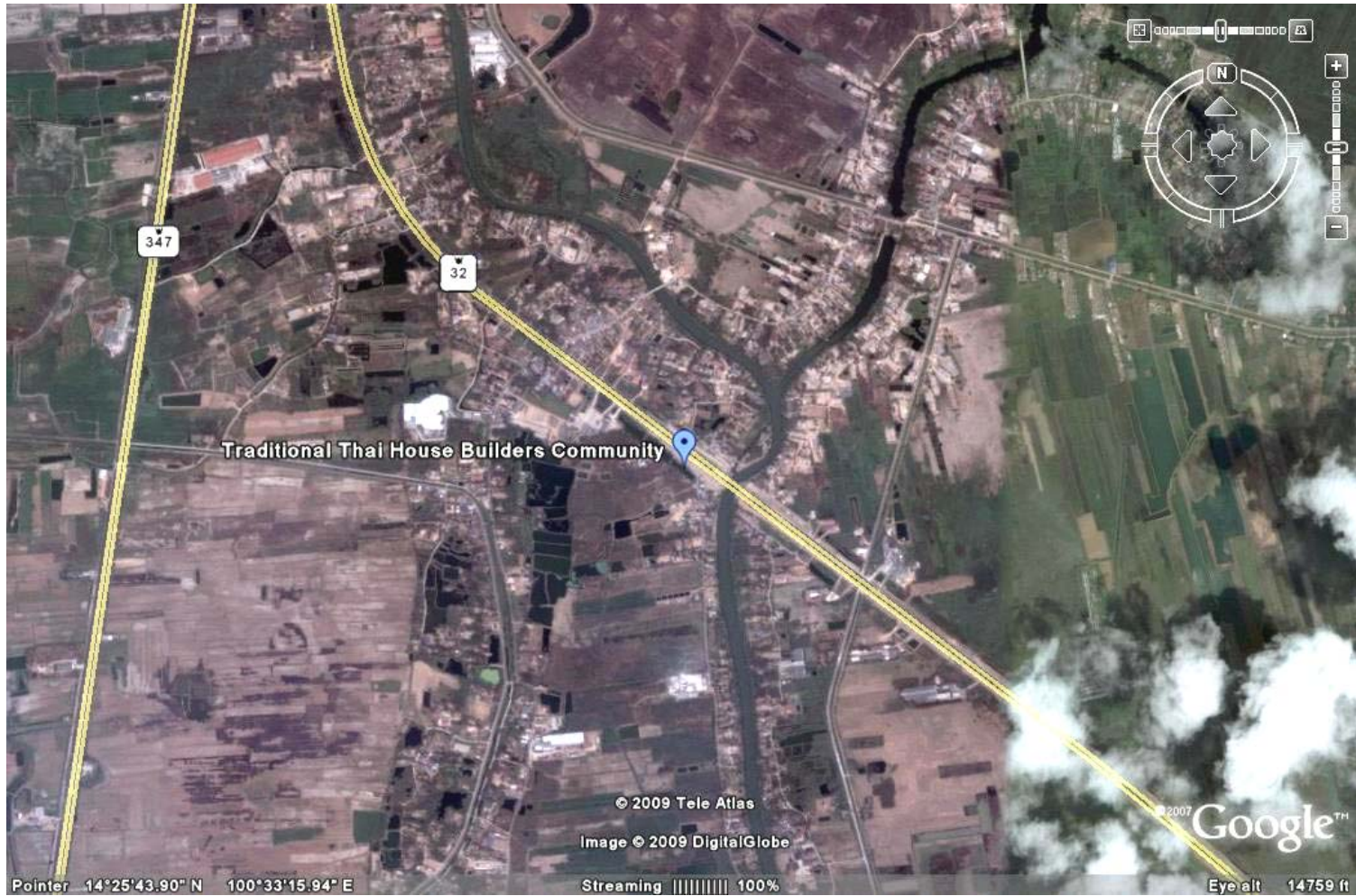


Figure 32: Map of Bang Pa-han district, Ayutthaya Province  
[Source: Tourism Authority of Thailand]



**Figure 33: Satellite picture showing the area along the national highway number 32 where the community of the traditional Thai house builders is located**  
[Source: Google Earth]

**Table 10: Overview of the builders' profile**

Category	n	(%)
<b>Age group</b>		
40-49	1	(17)
50-59	4	(5)
60-69	1	(17)
70-79	1	(17)
<b>Years of Working Experience</b>		
20-29	3	(50)
30-39	0	(0)
40-49	2	(33)
50-59	1	(17)
60-69	1	(17)
<b>Type of Expertise</b>		
Master Builder	5	(71)
Master Carpenter	2	(29)

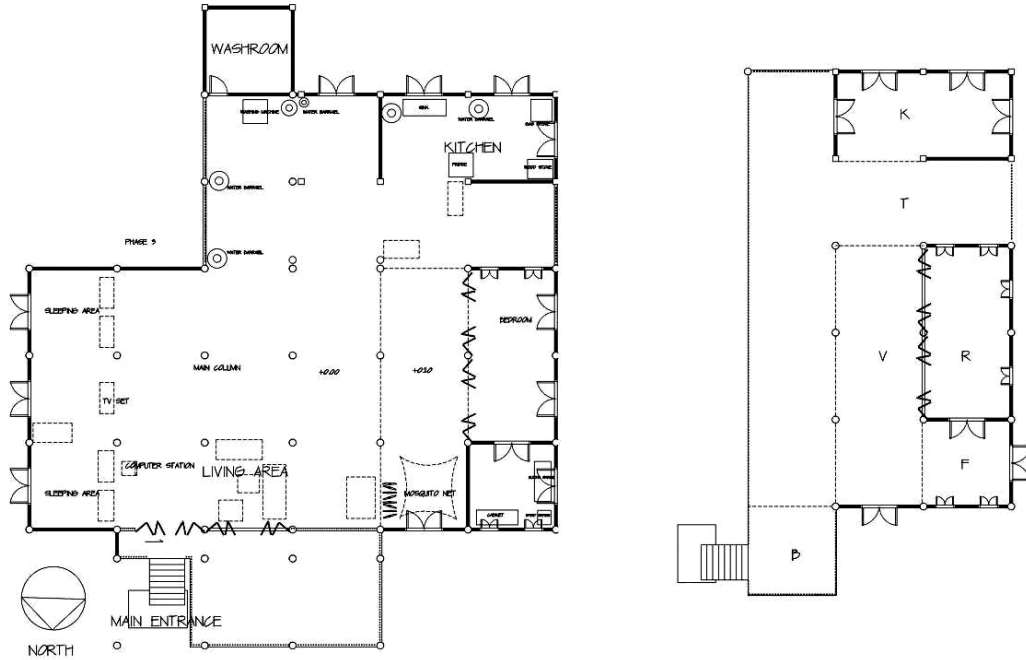
Total Number of Builders Interviewed = 7

## **Direct observation and artifactual documentation**

These two approaches enable an examination of objective evidence resulting from the farmers' lifestyles. This includes observable behavior of the home's occupants; along with physical modifications made to the structure of the home to fit their life pattern. The artifactual documentation of houses sampled for this study was collected using photographs, videotapes, and annotated drawings of floor plan layouts. The scope of documentation covers the interior, exterior as well as the landscape surrounding the house.

In this study, annotated floor plan drawings prove very useful for comparing how the houses have changed over time. With help from the interview respondents, the researcher is able to reconstruct the historical spatial layout of the some of the houses, and compare them with the current organization. These insights into domestic experience and how they have changed would be difficult to obtain through either the direct observation or the interview alone. For the analytical purpose, the floor plan of both (reconstruction of) the historic home and contemporary home of the same house

are converted into the justified graph (or gamma graph) to compare the spatial organization of the interior spaces as well to calculate the spatial value by using Space Syntax method.



**Figure 34: Example of a comparison of modified and historic floor plan layout (H02) constructed from the direct observation and the interview account**





Figure 35: Sample of artifactual documentation from one of the farmers' house (H02)

## **Survey of temple mural**

To understand how the place experience and the physical attributes of the house have been transformed over time, we need to compare the current information with the historical record. Partial information on the historical aspect of the farmers' domestic life can be obtained from the aforementioned data. The murals though are not infallible historical sources, but they can be very informative about the societies in the previous time.

The Thai murals usually have lively detail and vibrant colors, which offers a rich record of the culture of old Thailand. They prove to be a supplementary source of information that provide the tangible historical aspect of the domestic life of the farmer, and can be used to triangulate with data from interviews and direct observation. Study of murals provides insight into the historical aspect of the farmer's domestic life, the community, as well as the physical features of the dwellings.

In Thailand, mural paintings are created primarily for religious purposes. Murals are found in Buddhist temples throughout the country. The temple murals are filled with images of people and structures of all sizes and shapes depicted in various cultural backgrounds (Wyatt, 2004). Mural paintings in the temple usually display 'Jataka' stories, which are derived from the ten lives of the Lord Buddha prior to his attaining enlightenment. Although the focus of the painting is on the Buddha's past lives, but the details of the paintings are inculcated with the dynamics of the domestic and social lives of the local people. While most of the stories revolve around the palaces or the characters of royal lineage, the local artists have also subtly infused a depiction of laymen and their domestic lives into the sacred sphere of the temple (Ginsburg, 1989; Wyatt, 2004). Such infusions were probably added for the pleasure of both the artists and their audiences.

All of the monasteries in this study are located in Central Thailand, and two of which are in Suphanburi province. The ordination halls that house these mural paintings were part of the older monastery compounds that were established more than 150 years

ago. The paintings themselves were created by the local artists, during the original construction of the monastery, with tempera on wet plaster technique.

Selection of temple for the survey of mural paintings were based on the recommendation of the experts in Thai Studies (Nawigamune, 2006) as well the Thai vernacular architecture scholar (Khuyson, 2007). Photographs of mural paintings are collected from five old monasteries located in Suphanburi, Angthong province, and the Bangkok area. The following table illustrates the monasteries and its detail:

**Table 11: Monasteries from which the mural paintings are studied**

Monastery	Location (Province)	Region		Type of Data Collected	
			Years established	Domestic life	House Form
<b>Wat Khian</b>	Ang-thong	<b>Central Thailand</b>	n/a	●	
<b>Wat Pratusarn</b>	Suphanburi		>200	●	●
<b>Wat NorBuddhangura</b>	Suphanburi		328	●	●
<b>Wat Dawadueng</b>	Bangkok		160	●	
<b>Wat Suwanaram</b>	Bangkok		n/a	●	●



Figure 36: Clockwise from topleft: Wat Pratusarn, Wat Khien, Wat Dawadungsa, Wat Suwanaram, and Wat Nor Buddhagura



Figure 37: Examples of temple murals from the survey

## **Archival search of existing research literature and records**

The archival search of the existing research literature and government records proved crucial for this research study. These secondary data helps supplement the information relating to the social structure, influential government and economic policies that impact the livelihood and family structure of the Central Thai farmer.

The secondary information used in this research, particularly on the changes in the agricultural system economic structure, was retrieved after the first round of fieldwork, and initial coding of the interview data. Several interviewees have mentioned the issue relating to the government implementation of “Land Consolidation” as one of the prominent factors affecting the farmer’s lives, which prompt the researcher to search for further information on this topic to be collaborated with the other type of data.

However, for clarity, the secondary information in this study is presented in the literature review section; this material is referred to during discussion of the results.

## ***An overview of the research plan***

This section presents a brief overview of the research study on the transformation of place experience and physical attributes of the traditional Thai home to be used as a roadmap for thorough discussion of the data sources and its profile in the next section. The content in this section includes description of procedures for data collection, data reduction, and data analysis.

The first phase of data collection was devoted to a survey of temple murals. The mural paintings from 5 temples in the Central region have been photographed and collected for the historical data on the house features and the lifestyle of the farmers. The information derived from the preliminary analysis of the mural paintings also serves to provide a platform for constructing the questions used in the semi-structured interview with the house occupants.

The second phase is dedicated to the interview, survey and observation of the traditional Thai house in the farming community. During each interview session, the researcher videotaped the interview session, videotaped the house, photographed the house features, and drew an annotated floor plan of the house.

There are two types of annotated floor plans collected from each house; the current floor plan, and the historic floor plan of the house. The annotated floor plan, of the current dwellings, documents details about the activity area and household items that represent the contemporary lifestyle of the family members. When the sketch of a current floor plan was ready, the researcher asked the family members to explain and compare it with the original house that they experienced in the past, and then produce the historic version of the house's annotated floor plan to be used for the comparison in both qualitative and Space Syntax analysis.

The third phase of the study consists of data reduction and data analysis. Content analyses were performed on transcripts from interviews of house occupants and interviews with master builders. Content analyses for photographs of mural paintings and the farmer's house were performed using the qualitative analysis software NVIVO 8 (Appendix B). Drawings of floor plans for both the historic houses and the modified houses were also prepared (Appendix C). At this stage, the researcher revisited each research site to verify the accuracy of the floor plan drawings against the actual house, and to verify interpretation of the qualitative data with the informants.

The annotated floor plans obtained from the previous phase were used for space syntax analyses. Space syntax measures such as 'relative asymmetry' (RA), and 'integration value' (I) were calculated, from the justified graphs derived from the aforementioned floor plan, to quantitatively describe quality of the domestic space.

The four major sources of qualitative data for the study of the Central Thai farmers' houses include (1) semi-structured interview of its occupants, (2) semi-structured interview with master builders, (3) artifactual documentation, and (4) direct observation of both the structure and the lifestyle of its occupants.

The final phase of the research study includes an integration of data derived from the temple murals survey, qualitative analysis of the interviews, and space syntax analysis to construct and compare the changing place experience in the historic and modified homes of Central Thai farmers.

**Table 12: Summary of data collection details and locations**

<b>Temporal aspect</b>	<b>Data sources</b>		<b>Type of data</b>
<b>Historical &amp; Contemporary</b>	Thai farmer Houses: Suphanburi Province, Central Thailand	<ul style="list-style-type: none"> <li>● 15 Houses in farming community</li> </ul>	<ul style="list-style-type: none"> <li>● Photographs</li> <li>● Videotapes of semi-structured interviews with family members</li> <li>● Floor plan drawings (historical &amp; contemporary)</li> </ul>
		<ul style="list-style-type: none"> <li>● 2 Museum houses (Farmer's houses)</li> </ul>	<ul style="list-style-type: none"> <li>● Photographs</li> <li>● Videotapes</li> <li>● Floor plan drawings (historical)</li> </ul>
	Master house builders	<ul style="list-style-type: none"> <li>● 5 Master builders</li> <li>● 2 Master carpenters</li> </ul>	<ul style="list-style-type: none"> <li>● Semi-structured interview</li> <li>● Photographs</li> <li>● Videotapes of semi-structure Interview</li> </ul>
<b>Historical</b>	Temple Murals: Ang Thong, BKK, and Suphan Buri Central Thailand	<ul style="list-style-type: none"> <li>● Wat Khian</li> <li>● Wat Pratusarn</li> <li>● Wat Nor Buddhangura</li> <li>● Wat Dawadueng</li> <li>● Wat Suwanaram</li> </ul>	<ul style="list-style-type: none"> <li>● Photographs</li> </ul>



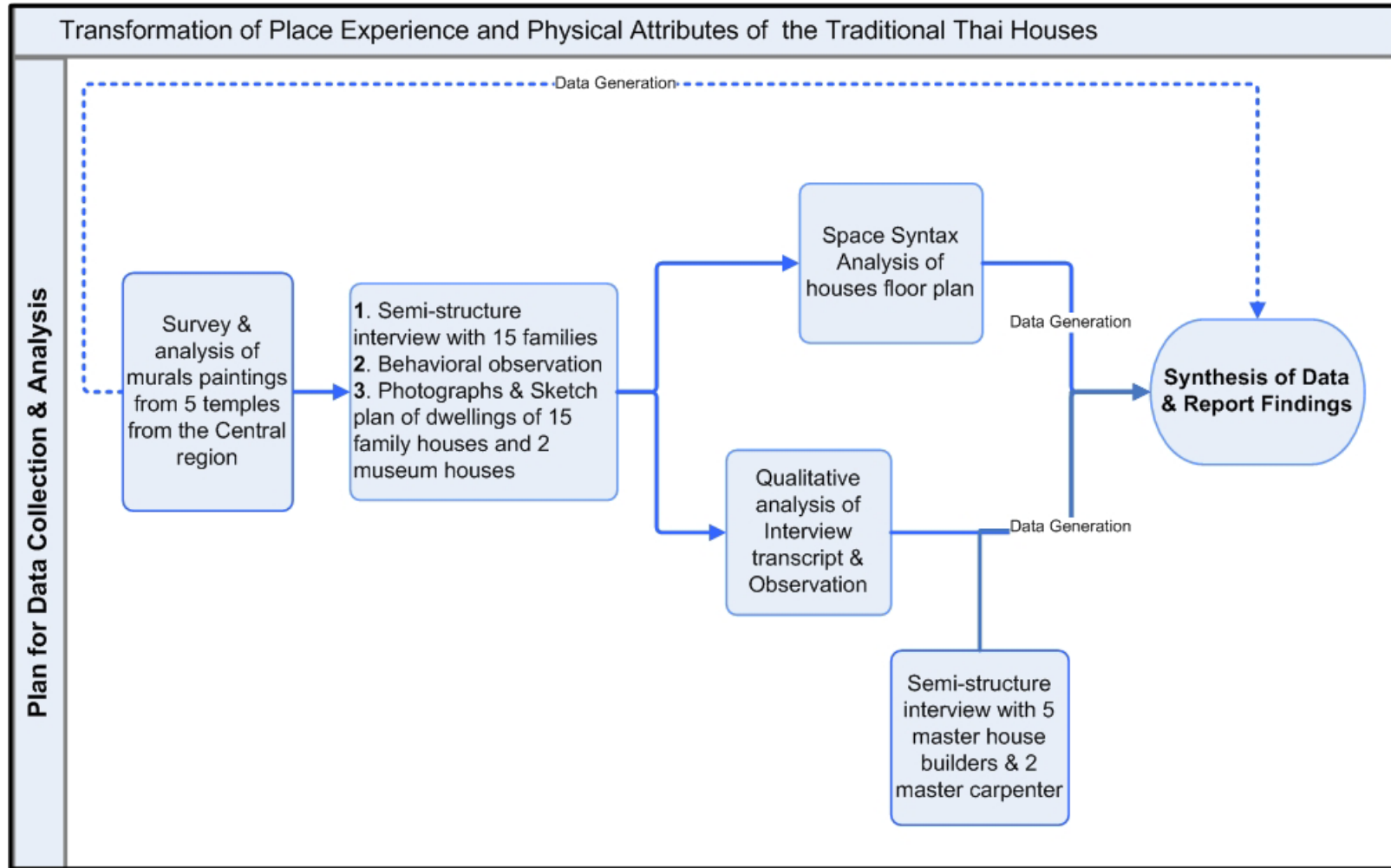


Figure 38: Flowchart for data collection and analysis

## Chapter Seven

### Family life and cultural values

This chapter presents findings for the Central Thai farmers' experience as part of the conceptual meaning of Place Model. Since this topic has not been previously investigated, the first section of study will explore “**the general characteristics of the cultural aspect of the domestic life of the Central Thai farmers.**” The following section presents findings of changes in the conceptual meaning of the Central Thai farmers, and “**how have their beliefs been transformed over time?**” Altogether with the changes in the social context of the past 50 years, these issues are deemed relevant to how dwelling design and the farmers' perception toward their house might have been transformed.

Mixed data collection methods are employed to gather data on the Baan Krang's farmers' lives, explain their way of thinking, and describe how all of these have changed over time. The primary data collection approach consists of a semi-structured interview of both the house occupants and the master house builders. All of the interviews were videotaped, transcribed, and coded for content analysis. Supplementary data collection approaches include direct observation, artifactual documentation and survey of temple murals.

#### ***The family life***

The analysis of interview transcripts indicates that gender roles and the division of labor in the family, for the most part, have not changed from previous generations. Several female empowering practices still exist in the culture of the Central Thai family.

Upon closer examination, it seems that these strategies help to even out power and authority among male and female family members rather than to make the society entirely matriarchal. These practices include marriage and resident rules, and rules for the inheritance of the house. Topics discussed in this section also include other issues related to the dynamic of gender roles within the family such as authority, financial management, and the division of labor.

## Family Size

The size of the family in this study ranges from 1 to 5 household members with most households having 2 to 4 members. Half of the families interviewed have 3 generations under one roof. This is not a very large family size at all considering it is in a farming community. Many elderly interviewees indicated that they have several children who had moved to urban areas to engage in occupations besides farming. A few indicated that their children relocated to other countries, but they would visit the parents from time to time.

**Table 13: Number of children of interviewees**

<i>Category</i>	<i>n</i>	<i>(%)</i>
<i>Number of Children of the interviewee</i>		
1-3	9	60
4-6	4	27
7-9	2	13

Total Number of Family = 15

Historically, the size of the Thai farmers was not static as the family went through cycles of expanding and contracting size. A young nuclear family might be composed of one or two generations. The family expanded when a daughter is married, and her groom moves into the wife's family, or vice versa. However, this moving in would last only for a few years. The newlywed might remain with the bride's parents as an extra farmhand, and to save funds sufficient to establish a new residence. Two of the elderly males noted that they had to stay with their wives family for a couple years until they had enough savings to build or buy a new home of their own. Once the newlywed family moved out, the parent's family became smaller again. And it would go through a process like this through generations.

The flexible construction characteristics of the older Thai home were found to be very conducive to modification of living space within the home to fit the needs of an ever changing family size. Types of modifications ranged from expansions, reductions, to reconfigurations. Also, because homes were constructed of prefabricated modular knockdown panels, the performance of such modifications was considered easy. All of the house builders, in the interview, concurred that the knockdown panels makes it easy to be assembled and dismantled within a short time as one of the builder mentioned *“dismantling the house did not take long. It can be done in only a few days if you want to preserve the parts and reuse them again.”*

When the family expanded, the farmers could either fit the additional living compartments into the main platform by reconfiguring wall panels to open up more space. When the family size grew smaller, parents might decide to give away portions of the house such as one of the living compartments to the young family that just moved out.

**Table 14: Overview interview sample profile**

Category	N	(%)
<b>Number of Household Members</b>		
1	1	(7)
2	4	(29)
3	2	(14)
4	5	(36)
5	2	(14)
<b>Number Generations within one House</b>		
1	2	(13)
2	5	(33)
3	8	(54)

Total Number of Interview Participants = 30

Number of Family Interviewed (N) = 15

### **Collective family units**

Approximately half of the interviewees lived in a three-generation household. Many of the unmarried grownup male or female adults who had not migrated to an urban area still shared the same house with their parents. These offspring typically helped out with the work in the paddy fields, or cared for nieces, nephews, and elders

For delegating tasks in the family there were no strict criteria besides physical strength. Half of the interviewees agreed that ‘everyone’ did their part in taking care of household chores and farm work. The children, after the lactating period, would be raised by many close relatives, such as their aunts or grand parents, until they were strong enough to work in the field with their parents and other adult relatives. This was probably a residual tradition from the subsistence farming period when a large number of family members stayed close together to share both the household chores and the hard work in the paddy field. One of the elderly female interviewees stated that being a family meant “to be together...we work together and make decision together.”

Due to the hard working life of pre-technological farming, the farmers did not have much time together at home in the past as the major part of their time was devoted to taking care of the field and the livestock. According to the interviews, the only time the entire family got together was at dinner time which usually took place before sunset.

The elderly interviewees recalled life in a large family as positive, and indicated that they did not have privacy problems when living with many relatives. One of the elderly females noted, “I didn’t need to be alone...I didn’t have any secrets.” While another declared, “I don’t want to live alone...there’s no one to help you when you get sick.”

In the past, individual privacy and division of property were not considered important. One of the elderly master builders noted that “in the old time...people didn’t really care about trespassing. There was no fence around the house like they do it these days.” Two thirds of the interviewees indicated that it was common for several families of relatives to live close together in a large cluster. While each family would have separate dwelling compartments; the dwellings would be connected through the extended terrace or bridged by several wood planks so that people could go to each other house without having to climb up and down too many times. Food sharing among relatives or neighboring houses was quite common, and considered a community bonding ritual. An elderly female interviewee recalled that the “old timers liked to have descendants live nearby...Easy for visiting and sharing meals.”

## Marriage and Residence Rules

The marriage and residence rules of Central Thai farm families can be described as a matrilocal marriage system where the wife’s family determines the residence of the new family unit. However, this practice is quite flexible, and can be easily adjusted when required. To date, the Central Thai farmers still practice this residence rule as they had done in the past.

Emerging from this developmental cycle was a cluster of related and cooperating households consisting of the extended stem family household and the households of those daughters who had settled nearby with their husbands. That pattern was predicated on the continuing control over land and other resources by the senior couple. The closeness of these related households and the extent of their cooperation in a range of domestic activities varied considerably.

**Table 15: Residence rule in the Baan Krang community**

Category	n	(%)
<b>Residence Rule</b>		
Groom moves to Bride residence	10	67
Bride moves to Groom residence	4	27
n/a	1	7
Number of Family Interviewed (N) =	15	100

Two thirds of the husbands in this study moved into the home of their wife’s parents after marriage. This practice does not cause resentment among the newlywed husbands, as they were pleased to have the in-laws taking care of the wife during childbirth and childrearing. One of the elderly men noted: “We never quarrel about our parents. You love your parents. I loved my parents. So, we must respect each other.” In addition, other factors such as arrange marriage and long engagement also create a stronger bond between the in-laws. An elderly farmer recalled that his courtship to his wife went on for a couple years, and “when I went to her house...I talked to everyone...about farming...about everything. Her parents were always there when we met.”

A number of elderly males made similar remarks about the in-laws’ role when his child was born in the house. One of the elderly said: “Oh! I didn’t have to do anything.

Her parents took care of everything when the baby was born. They really loved their daughter. I only looked outside.”

The Thai women of the Central Plain have enjoyed constant support from their immediate family. They are less constrained by the role of housekeeper as many of the tasks have been shared by their own relatives. This practice has enabled these women to go out and work in the field along their husband’s side.

## **House Inheritance**

Among Central Thai farmers the inheritance of house and farmland is a major concern. The farmland is, by and large, distributed equally among the offspring either while the parents are still alive or after deceased. However, they have not employed strict rules for determining the inheritance of the house. The house might be seen as a posthumous reward for being grateful child and taking care of elderly parents.

It is typical for a family member or the person who lives with and takes care of the elderly parents, to inherit the house, and often the heir will be a female offspring. Nine of the families interviewed agreed that the house should go to the last person who stayed with and took care of the parents. One of the interviewees noted:

*“...an older daughter has to take care of house chores as well as younger siblings. My eldest sister works harder than any of the other siblings, and is the most reliable and responsible. She took care of us and stayed with my parents when they got old. She deserves to get the house.”*

One of the explanations that a daughter is preferred over the son when it comes to inheritance of the house is that the male is perceived as physically stronger than the female. An elderly man mentioned a Thai saying attesting to the frequency of this practice, “a son gets the money, and a daughter gets the house.” With physical strength and sufficient initial financial support from the family, a son is expected be able to establish a residence and provide for his family on his own.

In some the house would go to the son if the parents had no daughters. Also, there is a practice that parents will dismantle the house into several compartments, and distribute these compartments among the offspring. As one interviewee mentions: “It was my mother’s last wish was for me to give the kitchen parts of the house to my younger brother.”

The prefabricate structure of the traditional house made it easy for the parents to divide the dwelling among their off-spring, which is indicative of the power structure of the family. The custom of splitting house compartments and distributed among off-springs might presumably have emerged out of necessity.

**Table 16: Distribution of house inheritance among family of interviewees**

Category	n	(%)
<b>Inheritance of House</b>		
Inherited from wife's family	8	(53)
Inherited from husband family	4	(27)
Purchased	3	(20)

Number of Family Interviewed (N) = 15 (100)

Both the house occupants and the master builders indicated that the practice of splitting the houses and distribute its parts among the off-spring is hardly seen anymore. Two of the interviewees stated that their parents would make a decision about who will inherit the house. However they noted that one did not have to split the house if the parents had enough money to give away for their children to build a new one. In addition, direct observation shows that many of the contemporary houses have been reinforced with concrete or other materials that are not conducive to being moved. Thus, the physical properties of the contemporary house no longer lend themselves to the easy knockdown system.

## **Family Hierarchy**

Social hierarchy has a strong bearing within the family structure much as it has throughout Thai society generally. Apart from the class system, there is the regard for seniority that Thai people use in managing personal interaction. The concept of seniority is prevalent in Thai society, and is reflected in use of 'fictive kin' in Thai language. In every day life, common people would address one another as they would address a family member. For example, one would call a slightly older person 'phi' (elder) or the younger one as 'nong' (younger one). It is not uncommon at all for an elderly man to be called 'dta' (grandfather), or elderly woman to be called 'yai' (grandmother). It is considered polite to call and treat an older person the same way one would treat one's family



member. However the use of ‘fictive kin’ pronoun is increasingly rare among urban dwellers.

Results from direct observations and interviews suggest that authority in the family may not have anything to do with the ability to be a breadwinner, but more so with seniority. Seniority is very important to the Thai family as it provides a hierarchal structure within the family. For the Thais, seniority is equated with age and experience, and therefore respect. According to the interview, although there are several generations living together in the house, an elderly man (the oldest generation in the family) would consider himself as a family leader. All of these elderly men are more than sixty years old, and do not work.

Many of the elderly interviewees, both male and female, indicated that they had been active in decision making, and leading several initiatives for the entire family. Both in the past and contemporary time, the elderly farmers have remained very active and assumed diverse roles in the households. The younger generations perceived the elderly as “pillars of the family” as they “provide good advice.” The elderly also played roles in “initiating new projects,” “raising young children,” “taking care of the farm animals,” “cooking for the family,” and even earning extra income for the family, but most importantly they decide who will inherit the house and distribution of the farmland.

Seniority has a strong influence on the authority structure in the family. This hierarchal family structure has been embedded into vertical hierarchy of space in the design of historical home, and extended to spirit abodes outside the house. On the main platform that supports the whole living compartment, there are at least two to three varying floor levels that are approximately eight to twelve inches differences. Six of the interviewees indicated the inference between seniority and the height of the floor. As one master builder offered that “when we talk to the elderly, they get to sit on the higher floor, and we are on the lower... that’s how we show them respect.”

However some of the interviewees believed that the hierarchical flooring design had emerged from practical usage. Two of elderly men and a master builder reason that such as to “prevent rain from splashing into the living compartment” in the historic home where the terrace was uncovered by the roof.

The highest floor level in the house is also an area where the farmer's family keeps all of the shrines in the house. The lower level of the main platform is generally not covered by the roof, and is used as the multifunctional area. Further discussion relating to vertical hierarchy of space and the concept of 'Sacred-Profane' (Eliade, 1957) will be presented in the 'Emerging Themes' section.

## **Financial management**

Financial management within the family could be used to determine the family's power structure. In all but one family in the interview sample, the family money is kept by the women.

In a family with several generations living together, this duty is usually taken over by a wife of a breadwinner generation (2<sup>nd</sup> generation), but not the elderly parent or the unmarried female sibling who might be sharing the same house. However, the female's role in taking care of the family money can be compared to the treasurers' duty; as her task is to make sure that the money is in safekeeping. Most of the income of a married couple is kept by the wife. "All that I made, I gave it to her for safe keeping." All the men in the interview samples have been very proud their wife's virtue as a good family treasurer as one elderly man said "*My wife can neither read nor write. I am good at math, but she can count and calculate the money much faster than I ever could...she could do it in a flash!*"

The practice of making a family treasurer out of the wife may deceptively portray a woman as the family authority, but eight elderly interviewees agree that consent from both husband and wife is required when it comes to making financial decisions. In addition, the entire interview samples concurred that the wife will never withhold money when he is in need. As one interview respondent puts it, "I always give her money easily; she will give money easily to me too!"

Accordingly, the female interview samples state that they trusted in their husband's judgment when he requests money; that it will be for the benefit of the family. This means that male and female leaders of the family play complementary roles in financial management based on devotion and trust.

## **Labor division**

There are two important groups of actors in the labor division within the Central Thai family. The first group is the husband and wife, of working age, who are the breadwinner couple. The second group is the supporter whose major task is to take care of the children, the elderly, and keeping the house.

The house was founded on marriage, and the married couple is a core of the house. Eight of the interviewees concurred that the working couple engages in farming activities together—both working on the paddy field and to take care of the livestock. However, a wife who had given birth was required to stay at home with her baby during the lactation period. As soon as a child was old enough, she would be out in the field again leaving her offspring at home with her parents or relatives.

Labor division between husband and wife can be perceived as complementary, and has not been changed much over time. Work assignment seems to be based solely on physical competency. Six of the interviewees state that they (the husband) take care of hard work around the house, and in the farm. The wife will also work side-by-side with her husband, but typically with less strenuous work.

Supporters found in large stem families may be composed of both the male and female elderly, and/or the single female relatives who remain with the family. These unmarried females are perceived as having an important status in the household. They are well loved by the young children, and trusted by the elderly parents. They are even entitled to inherit the family house. One of the elderly females who still lived with her relatives inherited a house from her parents, but has not lived in that house as she reasoned, “My mother said to give the house to me.... but I never get to stay there. My nieces, nephew, and cousins will make a big fuss if I were to go away. They love my cooking. They like me to be around to play with them.”

While work in the paddy field is too laborious for elderly family members; they many nevertheless continue to have an active domestic role. They do some chores such as watching over the little children, and taking care of the family livestock.

In terms of domestic work, women are not always obliged to prepare food or clean. Several male interview respondents indicated that they can and do enjoy cooking and taking care of the children.



**Figure 39: An elderly woman taking care of her grandchildren during the daytime while the parents are out in the paddy field**



**Figure 40: An elderly man preparing a meal for his grandchild and himself**

One of a younger interview respondent noted that her father could cook very well, and may get into the kitchen from time to time. Accordingly, one of the elderly female comments, “My children’s father was so good... When no one was around, he could take care of the kids and cooks for himself.” There is no taboo associated with cooking or doing housework ingrained in the Central Thai culture.

The children, when old enough, are required to help with the family chores. The chores assignments are not gender specific as many of the interviewees, both male and female, indicated they learned to cook, clean, and care for their younger siblings since they were young. A 63 year old elder man recalls “*I was the oldest child. When I was ten years old, I helped my mother with everything in the house...cleaning, cooking, and taking care of the younger siblings.*”

## **The Livelihood**

All of the interview respondents perceived the Land Consolidation program that was augmented by the government in 1974 as a positive change because their livelihoods have been improved significantly with the extra earnings. This program has been mentioned a number of times by the interviewees as a turning point in their lives.

With the increased income from the intensive rice farming that was enabled by the Land Consolidation program, many well-to-do farmers expanded their farm holdings, and relocated to areas closer to their newly acquired land. Several families also allocated a good portion of money to home improvement projects. Farmers could now afford a more comfortable lifestyle after a long day of hard work in the field. Time spent in the home was considerably lengthened while time in the field was shortened.

Roadways that came after the Consolidation program are seen as a two edged sword. The roads replace the river as a more efficient transportation mean. On the bright side, community members have benefited from faster access to medical treatment and easy crop transfer to the town center. The roads are considered the infrastructure that made the lives of the farmer easier. Concrete paved roads allowed the rice to be hulled and transported directly from the farmland. The shared space near home that was used for drying and hulling rice by members from several families was neglected, and home was not part of the modern rice production unit any more.

Several interviewees noted that in the past they had to get up at four in the morning, and their entire day was spent working on the field. Some families owned paddy fields that were located farther away than half a days walk. For such families, both the husband and wife had to relocate to the field for work and time efficiency. One of the middle aged interviewee recalled that, “Both of my parents had to move to paddy field...camped out over there for three months each year. They had to leave me with my grandparents. I didn’t get to see them until the harvesting season was over.” Now with the road and vehicles, the farmers can drive home for lunch and return to the field after eating.

On the negative side, roads are perceived as a means to bring threats to the community. Approximately one quarter of the interviewees mentioned the rising number of threats the road brings to their community, which includes petty theft, robbery, and swindling. The dispersion of the homestead type settlements, coupled with reduced family size, increases concerns for the safety and welfare of the elderly staying alone at home during the day. One of the master builders compared the current problem of robbery with the past as, “There was not so much robbery in the old time...only buffalo napping!” The Baan Krang farmers have traded-off the sense of security, of a life living among close relatives, with the better economic opportunity that came with an increasing isolation of the residence.

## **Cosmological Belief**

### **The practice of Buddhism and Spirit Religion**

The combination of Buddhism and Spirit religion practice permeates almost every aspect of the Thai life ranging from giving birth, mortuary rituals, house building, and agricultural practices. Similar to the pagan religions of the western world, the Spirit religion of the Thais involves the ritual of dealing and bargaining with several kinds of spirits that influence the fates of humans, climactic and geographic conditions.

The families of Central Thai farmers practice both Buddhism and Spirit Religion. Buddha shrines, spirit abodes and Spirit religion idols are seen in every household. However, interview accounts indicate that the lives of the Central Thai farmer have not

been as strictly tied to superstitious rules as those of the Northern or Northeastern Thai as reported in the anthropological literature.

The practice of Buddhism in Baan Krang can be perceived as a set of more formal and community binding activity for the community members, while the Spirit Religion is involved with the practice of individual communion with spirits within each household. Despite the assistance from agricultural machinery, rice growing is intensive work that requires farmers to attend the fields seven days a week. However, farmers do take time off from work to go attend a congregation at the temple during the Buddhist holidays. One of the elder man notes “in the old time, we didn’t have a weekend break. We only took time off to go to the temple during the holidays, and then went right back into the field.”

### **Dwelling domain and gender of the spirits**

Spirit Religion practices in Baan Krang include the daily worshiping and offering to the entities within and around the dwelling domain. There seems to be a connection between the domain and the gender of spirits. Male spirits tend to reside in the outdoor area while the female spirits are believed to reside in the structure of the house.

**Table 17: Domain, gender, and the spirits in Central Thai farmer’s belief**

<b>Domain</b>	<b>Gender</b>	<b>Spirits</b>
<b>Outdoor</b>	<b>Male</b>	<b>‘Lord of the Land’</b> (phra bhumi) <b>‘Grandfather Spirit’</b> (chao-tii)
<b>Indoor</b>	<b>Female</b>	<b>‘Female House Guardian Spirit’</b> (phee-loang) <b>‘Mother Spirit of the Hearth’</b> (mac-tao-fai)

Upon entering each housing compound, one could not miss the two spirit abodes located outside each of the dwellings. The spirits residing in these outdoor abodes are male, and believed to be ‘Lord of the Land,’ (Phra Bhumi) and ‘Grandfather Spirit’ (Chao-Tii). The residents believe that these two spirits are responsible for protecting the land and the whole property.

‘Female House Guardian Spirit’ (Phee-Loang), although is not presented in every household, are found in the form of wax idols or female figurine kept inside the room within the living compartment. Both male and female house occupants concur that this female spirit is believed to be a protector of the dwelling, and to have a special affinity with the female family members, such as, daughters-in-law. As one elderly male put it,

*“Yai-mo (Phii-mo) loves the daughter in-law more than her own...I don’t know why. When a son got married, a new daughter in-law must take care of the Yai-mo. We must tell her when we are going to do anything, and share with her the food that we have.”*

Another female spirit that has already disappeared from the contemporary homes of the Central Thai farmers is the ‘Mother Spirit of the Hearth’ (Mae Tao-fai). As with how she was addressed, her place was with the hearth in the kitchen. The relationship between Spirit religion symbols, labor division, and gender roles in relation to the use of domestic space may not be straightforward. Spirit Religion symbols suggest that the dwelling is a female domain, while the outdoor belongs to the male, which may be linked to an ideal labor division among genders. However, the actual practice suggested a more flexible fusion rather than a sharp division of work assignment between genders.



**Figure 41: Collections of spirit abodes (male spirit on the left side) and Spirit Guardian of the house (female spirit on the right side)**





**Figure 42: The hearth and cooking area shown in the museum house**



**Figure 43: The hearth has been replaced by gas or fire stove in contemporary farmer's home**

## Objectification of the seniority concept

Direct observation suggested the importance of a hierarchy for spirits that may be reflected in the forms of the spirit abodes. The residents stated that ‘Lord of the Land’ was more sacred than the ‘Grandfather Spirit,’ as he was a heavenly spirit, while the ‘Grandfather Spirit’ was merely an ancestor that came back to protect the descendants.

All of the ‘Lord of the Land’ abodes, in Baan Krang, are always raised higher than that of the ‘Grandfather Spirit.’ Furthermore, the abode of a more sacred spirit of ‘Lord of the Land’ looks more like an ordination hall in the monastery when compared to the ‘Grandfather Spirit’ abode resembles more the actual farmer’s house (Figure 46). A less elegant, but more homely, looking abode for ‘Grandfather Spirit’ has an actual ladder connected to it just like a real home.

Presumably the ‘Lord of the Land’ and the ‘Grand Father Spirit’ were not divided until recently. Accounts from the interviews with experienced master builders indicate that historically there was only one spirit abode per house. As he recalled, “No...none of the house that I had seen, when I was young, had two spirit abodes... It just recently that they made more...I have no idea why.”



Figure 44: A portrayal of the spirit abode in the 160 year old mural painting from Wat Suwanaram



**Figure 45: Another picture of spirit abode in the old mural painting from Wat Dawadungsa**



**Figure 46: Cluster of spirit abodes; the tall ones are 'Lord of the Land' abodes where the shorter ones are 'Grandfather Spirit' abodes**

Information obtained from direct observation suggests a link between spirit abode and symbolic representation of the property ownership. The interview respondents mention that they build a new spirit abode every time the property is divided, and a new owner is added to the land. In many sites, spirit abode compounds look rather like a small village in their own right.

### Summary

Table 18 summarizes and compares the historical and contemporary aspect of the family life and cultural value of the Central Thai farmers.

**Table 18: The past and present of the Baan Krang farmers' life**

	<b>Past</b>	<b>Present</b>
<b>Rice Production</b>	● Subsistence	● Commercial
	● Natural rain	● Irrigation System
	● Manual and animal labor	● Mechanized
	● Small holdings	● Larger holdings, but still own by individual farmers
	● Production days	● Production days
	● 1 crop/year	● Up to 5 crops/ two years
	● Surviving income	● Surplus income
	● Labor reciprocity among relatives and community member	● Hiring
<b>Settlement Structure</b>	● River cluster type	● Increasing homestead type
	● High density settlement	● Disperse settlement
	● River as mean of transportation	● Road as mean of transportation
<b>Family Structure</b>	● Alternate between extended stem and nuclear family	● Nuclear family with elderly family members
	● Larger family size	● Smaller family size
	● Seniority and hierarchy as importance family concept	
<b>Domestic Life</b>	● House as part of rice production unit	● Separation between the rice production and domestic life
	● Longer field hours	● Longer evening at home
	● Simple and practical lifestyle	● More amenities to support a more convenience lifestyle
<b>Gender Role</b>	● Gender equality	
	● Complementary role among genders	
<b>Cosmological Belief</b>	● Practice both Buddhism and Spirit Religion	
	● Practical implementation of religion rule, but increasing less superstitious	

The family structure of the Central Thai farmers have been changing due to external factor such as the introduction of the agricultural technology and transition of the country's overall economy. Gender roles of male and female members of the Central

Thai farmer's family are seen as complementary. Interview accounts reveal that gender roles in the Central Thai family has not changed much over time. Both male and female interview participants expressed contentment in the role of themselves and their counterparts. Male and female couples, of working age, play an important role in family's financial management where senior family members retain a certain amount of the authority in the family's decision-making. Perhaps more than gender differences, the concept of 'seniority' emerges as a significant factor influencing the Thai farmer's family dynamic. The importance of seniority in the family structure is visible, and reflected in the physical arrangement of vertical hierarchy of spaces within the dwelling. The residents of Baan Krang community have long been practicing both Buddhism and Spirit Religion. The farmer's changing lifestyle has coincided with the disappearance of some Spirit Religion symbols in the dwellings.

### ***Discussion: The impact of agricultural development and social change***

#### **On livelihood**

The review of changes in social context in Chapter Two coupled with the qualitative data analysis in this chapter indicate that transformation of the rice farming system along with the introduction of infrastructure that came with the Rice Farming Reform have been the major contributors in shaping the livelihood and lifestyle of this farming community.

Prior to the construction of these irrigation projects, rice farming in Baan Krang was highly dependent on the water from the river and the seasonal rain. In a natural condition, rice could only be cultivated once a year. There were difficulties for vehicles trying to access the paddy land since there were not paved roads. The rice crops were manually transported from the farm to the community for further processing and selling. Rice production was performed both in the paddy land and at the habitat.

Rice growing in Baan Krang turned from subsistence farming to full-fledged agribusiness in the 1980s. With increased earnings, and intensive irrigation supplies, farmers sought to expand landholding further inland to increase the crop output due to the shortage of arable land near existing communities. Cholitkul (2007) notes, in his record

for the Agricultural Land Reform Office, that by the early 2000s, 13 large projects, 3 medium size, and 74 small irrigation projects were built to distribute water from the river further into the dryer part of the land, which then covered 50.65 percent of Suphanburi province (Nupan, 2003). All of which had contributed to a more efficient irrigation management and agricultural system for Baan Krang and the nearby communities.

With the “Land Consolidation” program, the dykes surrounding all farmland were also rebuilt into a more geometrical form, and the rice paddy bed was leveled out evenly to increase the effectiveness of water distribution across paddy land throughout the irrigated area. But now with a better irrigation system coupled with the additional aids of agricultural machinery, farmers cultivated crops three times annually.

The intensive rice production also affected the migration of the labor force thereby reducing the average family size of the Baan Krang farmer. With an increasing shortage of arable land, some senior couples had little or no land to allocate to their offspring causing them to move elsewhere. Many younger members of the farming family were no longer compelled to stay with their family to help out as farmhands as agricultural machinery was widely used as a substitute for manual labor. The extended stem family was now a rare sight in Baan Krang.

Most notably, the growing commercialization of agriculture in the Central region and increasing landlessness in the 1980s diminished the ubiquity of reciprocal work arrangements (LePoer, 1987; Isvilanonda, 2000). This increasing income allows farmers to resort to hiring farmhands rather than using family or community members; that is, those who had no land or too little to subsist on worked for wages. This phenomenon was apparent in Baan Krang, and was witnessed during the fieldwork.

Put simply, the increasing rice production capacity has changed the lifestyle of the farmers in three major directions. Firstly, farmers work all year round instead of having slow times for leisure, or engaging in community activities after harvesting their crop. The community life has been replaced by intensive farm work. Secondly, the better road system along with irrigation networks enable the dispersion of the settlement from the existing location, thereby further weakening community ties. People have moved away from their safety nest to the frontier land where they could not rely on the social support from their well-known relatives. Third, the domestic life of the farmers has been altered;

the farmers are now able to spend longer time at home, and have enough funding for home improvement.

### **On family life**

The family life and cultural value of the Central Thai farmers can be, and has remained an egalitarian household with the equal partnership of a husband and wife; which is quite different from the North and Northeastern Thai household (Sparkes, 2005). As observed by Bloch and Janowski (1995), like the other Southeast Asian society, the Thai house was founded on marriage, and the married couple is a core of the house.

However, the family size has also been reduced, and stabilized when compared to those of the past. The contemporary Central Thai farmers no longer go through the cycles of expanding and contracting size (Prachuabmor, 2007). The contemporary family size has become static and much reduced as fewer labors are needed in the farm. Many younger generations have migrated to urban areas to seek better jobs, but will let their children stay with their elderly parents just they have experienced in the old time.

### **On collective living and community relations**

Today, the farmer's reliance on unpredictable forces of nature or large amounts of manual labor has been supplanted by the aids of modern agricultural technology. Monetary trade has replaced the barter system. Interactions among neighboring families and community members were greatly reduced. These changes lead to the transformation of settlement and house form which will be the focus in the discussion of the Chapter Eight.

Historically, the labor exchange system was based on villagers' relative parity in landholding and their participation in subsistence agriculture. Each household arranged with others to provide labor at various stages in the agricultural cycle; in return, the same number of units of labor would be provided to those who had worked for it. Besides a method of labor exchange, this system provided opportunities for socializing and feasting. The regularity with which each of households worked together served to strengthen the social ties of the relevant groups.

## **On cosmological belief**

The families of Central Thai farmers practice both Buddhism and Spirit Religion. Buddha shrines, spirit abodes and Spirit religion idols are seen in every household. However, the Central Thai farmer have not been as strictly tied to irrational belief or practice resulting from fear of the unknown as those of the Northern or Northeastern Thai as reported in the anthropological literature (Sparkes & Howell, 2003; Spiro, 1967b; Tambiah, 1976).

Though some Buddhist ceremonies are performed in individual households, it is a means to give blessing during important life events such as birth, marriage and death. Although the role of the Buddhist temple has been reduced from being both the educational and religious center, the Don Bhuppharam temple in Baan Krang still plays an important role as a community center where the farmers will take time off from their hard working in the field to participate in the Buddhist ceremony during the holidays.

The use of Spirit religion ritual as a way to commune and negotiate with what they believe to be higher authority to gain a sense of control and ability to process and accept hardships in life (Terweil, 1994) are much less pervasive when compared to the report in the existing literature. However, as technology has come to mediate nature, the farmers felt less required to commune with the higher spirit authority in order to exert control over the natural elements. Today, the interviewees report no strict rule that govern the domestic life or gender segregation that they have to abide by.

## **On perception toward home**

Historically, house was the center for everything in a farmer's life. The entire life cycle of the house occupants commenced and culminated in the house. The farmers had a strong tie with their residence since many of them never left the house that they were born into.

Every important aspect of life and the relating ceremonial ritual such as child birth, marriage, and death had taken place in the house. Several farmers indicated preferences for having a larger house space to accommodate guests that come to attend the ceremony at home. The 73 years old female farmer noted that "my parents wanted to build a large house. They want a large space for people to come over for their funeral"



while another elderly male wished that he had “larger ground space underneath the home to set up the banquet when we need to.”

The house also functioned as a temporary infirmary when required. When the river was a major means for transportation, the access to medical care was difficult. Once a person became ill, they often stayed at home until decease. More than half of the farmers noted that the funeral wakes of their ancestor were held at home for a couple of days before the deceased would be transferred to the crematorium. And the farmers, with their spiritual belief, wanted to return to their house in the after life as one of the elderly interviewee noted that she “this house is my ancestors,’ they wanted to be here with us that’s why we kept their ashes in the home.”

The house has been considered part of a descendant line. Several Spirit Religion symbols, including ‘*Phii-mo*’ (Spirit Guardian of the House) or Grand Father Spirit outside the home, display a strong tie between the current residents and their late ancestors as the residents claim that they are spirit of the ancestor coming to rest.

The house was also part of the agricultural production unit. In the past, there was a common area between the cluster houses of houses. These area were composed of a pond or a water well, a yard for drying and hulling the rice crop. Besides, a paddy field, this was a place where a community members work together to process their harvest. The terrace of the house itself had been used to dry the rice, after harvested, before hulling. One of the farmers recounted “in the old time, our terrace didn’t have the roof cover. We used it to dry the rice when there’s a flood.” Three of the master builders indicated that this was usually done during the flood time, and was often seen in Ayuthhaya province.

Today, several important activities and ceremonial ritual have been stripped away from the houses. With better road access, several functions and life ritual have been transferred to the hospital, and other facilities. Similarly, the processing of the rice crop has no longer been brought over to home. The concrete paved road allows direct access of agricultural machinery used in processing the crop, and transportation it out of the field. There is no need to bring the harvest home. Thus the function of the present day house has been much reduced.

The farmer's domestic life has been altered, with the intensive agricultural technology, the farmers gain considerable more income while the free time from the in each day is increasing. They have been able to spend more time at home, and have more money to maintain and buy amenities for their home.

The house is not just a representation of unity, but also of various kinds of hierarchical subdivision. The reflection of sacredness and spatial hierarchy, which can be found in the old design of farmers' houses, is a feature lacking in the modified house of the contemporary farmer's home. Historically, the symbolic elaboration of family seniority, which is important for the relations within the large family, is manifested in the spatial division and the floor levels on the main living platform of the traditional Thai house.

However, the significance of the family hierarchy still remains as a family dynamic although such objectification in the dwelling had been removed. Thus, it is likely that the elaboration and the division of the spirit abodes in the contemporary dwellings is an expression of the residences' affiliation rule that still exists at the present time.

## Chapter Eight

### Descriptive overview of the house

This chapter presents the physical aspects of the contemporary home of the Central Thai farmer's houses by concentrating on the “phenotype” or the enclosure and its architectonic details. It aims to describe the overall features of the historic home with the contemporary home by using the combination of artifactual documentation, direct observation data as well as themes derived from content analysis of the interview transcripts.

#### ***House profile***

The houses in this study belong to 3 villages within Baan Krang; Lahan, Yang Ka Kim, and Don Buppharam, which are located in an area with a high concentration of traditional Thai houses. Characteristics of these dwellings fit the description of the traditional House of the Central Thai region. They are made of living compartments that rest on a large raised platform supported by stilts, and have a steeply sloped and curving gable roof that rapidly drains rain during the monsoon.

Each of the inhabited houses still retains its key characteristics and original structure, wall panels, and the platform that made up the living quarters. However, to suit their current needs, the occupants have made varying modifications which somewhat alter the details and certain features of the house. How these modifications represent the changing lifestyle and perception of their home have become the central point of the investigation.

**Table 19: Type of house occupancy**

Description	Dwelling Number
<b>Inhabited house</b>	H01
	H02
	H03
	H04
	H05
	H06
	H08
	H09
	<b>Uninhabited house</b>
<b>Recalled from memory</b>	H10
<b>Museum house</b>	MH 01
	MH 02
<b>Total Number</b>	<b>17</b>

Out of the 17 houses documented, 15 houses are dwellings with live-in occupants, and the other 2 are old farmers' houses kept as a display in the outdoor 'Farmer museum' of Baan Kwai. The age of the houses in this study ranges from 68 years to approximately 150 years with an average age of 109 years. These are calculated from 11 houses with known age. Ages of the two houses from the Suphanburi's 'Farmer Museum' are unknown to the conservators.

**Table 20: House profile**

Category	N	(%)
<b>Age of the House (Years)</b>		
50-100	0	(0)
101-150	1	(7)
151-200	9	(60)
n/a	5	(33)
Total	15	
<b>Primary Interviewee' Time of Residence (Years)</b>		
1-20	1	(7)
21-40	6	(40)
41-60	6	(40)
n/a	1	(7)
Total	15	

Number of the occupied houses = 14

Number of the unoccupied houses = 1

Number of house recalled from the memory = 1

Number of museum houses = 2

Total number of houses surveyed = 17

The time of residence in these houses ranges from 9 to 81 years with the average of just over 55 years. A longer resident time indicates that the house is an ancestral home of the interviewee. A shorter residential duration usually occurred when the house was more recently purchased.

### ***House building and maintenance***

House building is an important event in farmers' life. According to the interview accounts, both the elderly farmers and the master house builders concurred that most of the time a house would be built as a bridal home for a newly wed couple. Over two third of the interviewees indicated that their houses were built as a bridal home for their great grandparents while the rest stated that they moved to the current house after a few years of marriage.

Traditional house building rituals could be elaborated with a series of Spirit Religion ceremonial rites that required a special shaman or Brahman to perform the particular ritual. Several anthropologists called this process "leasing from god," which means that the house is actually built on ground that is protected by spiritual beings. Thus, a prospective resident must show proper respect and ask permission to be able to peacefully and prosperously settle in such property. This ritual can be perceived as recognition for the respect between man and nature. However, most of the interviewees in this study are, for the most part third generation occupants, and none of them participated in the house building ritual. They therefore lack knowledge of these specific rituals.

The traditional Thai house is made of prefabricated parts that can be prepared upon order at the master builders shop. (Detail of the house parts and construction process are presented in Appendix E.) After the prefabricated parts are ready, they will be transferred to and assembled at the chosen home location. Contrary to common belief that Thai houses are quick to build, the experienced master builders concur that the prefabricated parts of the house normally take several months to prepare, and that the construction and assembling would take a least a month for a crew of seven carpenters.

With the entirety of wood construction, and as prefabricated panels, the house parts can be easily dismantled and relocated. Nine out of fifteen houses in this study

have been relocated, at least once, from its original construction site. The knockdown wall panels of the living compartments can also be rearranged to fit the current needs of its occupants. Accordingly, several interviewees indicate that the room arrangement within the living compartment of their houses have been changed many times.



**Figure 47: One of several types of wall panels waiting to be assembled in the master builder's shop**

Historically, the sole material used for building the house was wood, which were mainly the hardwoods that may be logged from the forest in the nearby province of Kanjanaburi. Teak is the top choice to be used as construction material due to its durability and resistance to termites.

The piecemeal process of collecting woods for house buildings may take a long time, and require patience. While, the house walls can be made of smaller pieces of wood connecting with intricate joinery, the floor and column are made of large and heavy trees. This is because they make a stable floor and do not required to be nailed to the beam structure. The entire house building procedure, starting from saving enough funds, collecting wood, waiting for the parts to be made, and construction of the actual dwelling

was a relatively long process. Thus, these houses are considered a prize possession of their owners.

It is not uncommon for farmers to buy a second-hand home especially when no time is available to spare for new construction. In this study, 3 of the occupants' homes are previously owned, and two are purchased from relatives of the current owner. However, if possible, the preference is to buy a home from kin rather than from others. Deaths that occur in the previously owned house are associated with negative prospect on the health, well-being and prosperity of the residents.

As reviewed in the preceding chapter that several parts of the historic house were open to the elements and prevention of the disintegration of woods structure of the home is of extreme concerns of the occupants. In monsoon country such as Thailand, the combination of heat, humidity, and rain have been the major causes for wood decay. One of the elderly farmer noted that he liked the open terrace, but "*the wood disintegrated when it exposed to the weather for too long.*" In a typical home, the terrace floor would be the first to disintegrate. Farmers have struggled to keep their precious home from exposure to the elements.

Figure 48, 49, 50, and 51 shows the overall architectural quality of the Central Thai farmers' house from Baan Krang sub districts.











## **House modification**

For farmers, home modification is by and large, a do-it-yourself project or with the help of local carpenter. They continually work on the project alternately with working in the field, and are proud of the home. One older lady mentioned, *“I just put on a new shed behind my house last month. I look at it everyday, and admire how nice it looks...I like it so much...I like every part of my home.”* While another also said, *“I love my house...the entire house. My parents built it the way my heart desire!”*

The modification in a typical home includes building extended roof to cover the terrace area, installing walls around the terrace to provide extra shield for the terrace. All of the interviewees indicate that they have had to build an extended rooftop to cover this area to save the large valuable floor wood that is no longer available in the local forests. As an elderly female house occupants complained that *“nowadays, wood is more expensive than bricks. It’s so hard to replace my terrace floor.”*



**Figure 52: Floor gap between the verandah and the living compartment that is large enough for a person to crawl into the house**

Another obvious modification entails the leveling the entire floor of the living platform to the same level. In two-thirds of the houses in this study, the terrace, and verandah floor are often raised to be same level of the floor in the dwelling compartment. Eight house occupants insisted that they like the ‘single’ floor level much better. As such, the distinctive characteristics of the hierarchical flooring have been clearly diminished.

Both middle age and elderly farmers agreed that the three-level flooring in the historic houses had made it difficult to walk around for both young children and elderly alike. Accordingly, a master builder concurred that, “*Today, people want the single-level floor, because it is easier for kids to run around.*” The occupants reason that the purpose for all the floor space to be on the same level is for 1) ease of maintenance, 2) ease of mobility, 3) make house seem larger, and 4) prevention of intruder that may crawl in between the floor gaps (Figure 52).

The ground area that was made of compacted earth, where people often used to relax in the afternoon, has been replaced with concrete flooring even though it releases more heat than the former. The top reason for this transformation is for the ease of cleaning and maintenance. The compacted earth can still get muddy during the monsoon and the flood season.

Almost all interviewees agree that the reasons for modification are primarily for the ease of maintenance, such as, preserving the woodwork and strengthening the home structure. Although in the eyes of a professional designer, the aesthetic quality of these projects may be debatable, the modifications have served the farmers’ perception of how home should be.

On one hand, the modifications of the house such as extended roof and extra surround wall have served its purpose in term of preservation. On the other hand, they may not be the appropriate solution in term of usage for the occupants. The extended roof, through uniting the entire living quarters, reduces the natural light and air ventilation. The house can be extremely uncomfortable during the heat of the day, and early evening. The ventilation for cooking in the existing kitchen has been greatly reduced until many occupants have to set up an extra open cooking area to prevent the family member from being smothered with the pungent smell of spices.

There is increasing trend in using modern construction materials such as concrete and tin sheets to replace the original organic material used in house construction. For example, tin roofing is used for replacing vetiver grass or terracotta shingle roof. However, both the farmers and the master house builders indicated that, in the past, they perceived tin roof as more ‘luxury’ and ‘practical’ material since it last longer and more expensive than the grass roof, and lighter than the terracotta shingle. A 71 years old master builder mentioned that, *“In the old time, it was really a luxury if you can have a tin roof.”*

Concrete is used to pave the formerly compacted earth floor underneath the living platform, and concrete columns are use to replace some of the house columns. The main reason for selecting concrete as a construction material is for its availability and durability. In addition, a few houses have begun to replace or strengthen the wooden columns that support the house with the concrete columns due to the infestation of termite, which are prevalent in the paddy land.



**Figure 53: A relatively dark interior in the modified home**

In some of the homes, the ground floor that used to be opened is now enclosed with walls to create additional living space, which is hardly used during the day time due to limited ventilation, stifling conditions, and poor natural lighting. In this sense, space gain has been traded off with the convenience of the usage. However, during the daytime, the occupants are required to sit in front of the house, for relaxation, instead of resting underneath the living platform as typical farmers do.

### ***Spatial components of the house***

Thus, the primary goal of this section is to compare the spatial pattern between the historic and modified home to 1) determine if there are common patterns for the spatial organization of traditional Thai dwellings, 2) to examine whether there have been any changes in the spatial organization of the original and the modified dwellings.

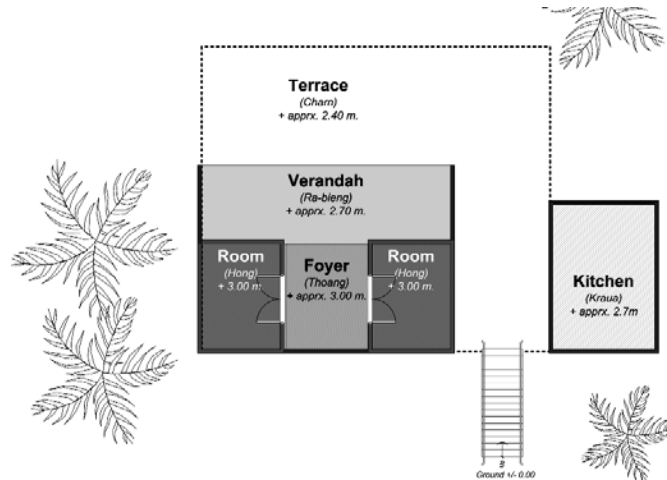
Floor plan layouts for the sample of 13 modified traditional Thai houses, in the analysis, are part of the artifactual documentation collected during the field survey. Floor plan layouts of the 15 historic dwellings are based on a combination of the informants' recollection and study of the remnants of the original structure preserved in the modified dwellings following modification. The floor plan layouts of two other historic dwellings are documented from the museum houses in Suphanburi. Further information on historic dwellings is obtained from archival records and scholarly texts (Chaichongrak, 1979; Chaichongrak, 2002; Chulasai, 1997; Panin, 1998-1999; Pongmethakul, 2002).

### **A room-by room comparison**

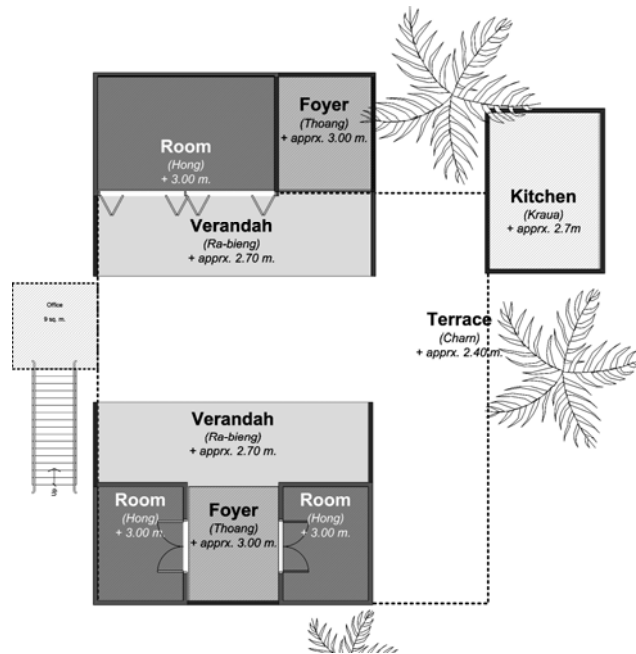
The term 'spatial characteristics,' in this section, entails more specific spatial qualities, based partially on the framework proposed by Hanson (1998), used for describing spatial qualities within domestic settings.

In historic houses, many areas, except the kitchen, were used interchangeably for a variety of purposes. Thus, the categorical special differentiation in the traditional Thai home was not determined by the furniture or the specificity of the usage, but rather defined by the dwelling's architectural features such as multiple floor planes, multiple roof planes, balustrades, and wall panels.

The following diagrams (Figure 54 and Figure 55) show that only 6 major spatial categories exist in the historic homes of the Central Thai farmers. These spatial categories include the ground area under the dwelling, the terrace, the verandah, the kitchen, the foyer, and the interior rooms.



**Figure 54: Diagram showing an example of categorical spatial differentiation within the single dwelling**

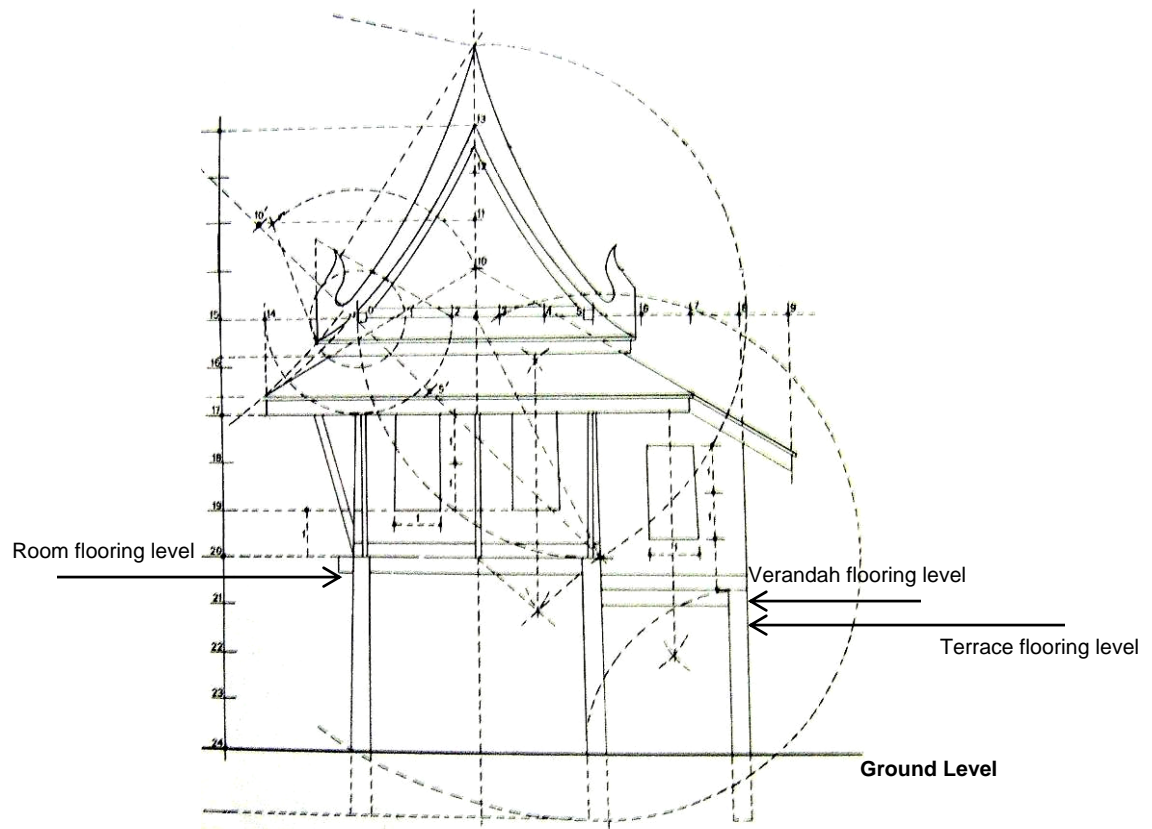


**Figure 55: Diagram showing an example of a categorical spatial differentiation within the extended dwelling**



## The ground area

Hanson's (1998) discussion on a categorical description of space is limited to the dwelling's interior space. However, for this study, it would be more appropriate to include the ground area underneath the living platform as part of the dwelling unit. This is because the Thai farmers have constantly utilized this open space for performing several activities that occupants of other housing styles would typically perform in the enclosed part of the house.



**Figure 56: Floor levels the living compartment and verandah of a single dwelling**  
[Adapted from: Kalayanamitra (1996) ]

The size of the ground area of each dwelling unit is proportionate to the size of the platform above it. The area is typically left open, without enclosure or other architectural elements to demarcate the space except the stilts that support the main living platform. The height of from the ground to the main living platform ranges from just over 2.00 to 2.60 meters, which allows enough room for people to walk around or conduct daily activities without feeling too claustrophobic. The ground area in a

traditional Thai home is characteristically rammed earth flooring, which resulted naturally from the bodyweight and frequent use.

Use of the ground area is multipurpose. During the monsoon season, which lasts approximately half a year, the ground area may be flooded by frequent rains, and can only be used for docking boats. During the dry season, this area can be used for storing agricultural instruments, such as cart and plough, fishing, or weaving implements.



**Figure 57: A photograph of historic dwelling, by Charles J. Charbot, circa 1929  
[Source: Graham (1929)]**

Although shaded by the platform, the ground area is visually open from all directions surrounding the house. It provides a suitable place for relaxation during the daytime as well as casual interaction with visitors. Any passerby or guest might stop for a conversation with families and friends gathered together for rest and relaxation. The condition and the utilization of the ground area in approximately one third of the modified dwellings investigated in this study still remain the same as those of past times.



**Figure 58: The flood covers the ground area of the dwelling during the monsoon season.**  
[Source: (Peranonda, 1982) ]



**Figure 59: A portion of temple mural from Wat Pratusaran, Suphanburi province, showing the rice hulling activity performed on the ground area underneath and around the dwelling**



**Figure 60: Ground area of a modified dwelling that is still left open just as in historic home**



**Figure 61: Examples of ground area modification in several modified Thai homes**

However, direct observation indicates an increasing use of durable materials, such as brick wall and cement flooring, in the modification of the ground area. There is no uniformity in types of spaces added to the modified ground area. These additional spatial categories include a multipurpose hall, sleeping areas, toilet, kitchen, storage room, or a combination thereof.

Enclosure of the ground area not only results in the compartmentalization of the space between the interior and exterior of the dwellings, but also leads to other perhaps unintended consequences. Such modifications weigh down the lightness and delicate form of the traditional Thai house.

With enclosure of the ground area, the once airy open space loses its natural ventilation and light. Consequently, there is an obvious decrease in the use of the ground area as a relaxing place for the occupants during the daytime due to the uncomfortable conditions mentioned above. However, this has been traded off with an increasing bedroom storage space. The bed room space has only been used during the night time, and with the ventilation provided by the electric fans.

### **The dwelling's entrance**

Traditionally, the Thai home is oriented toward the main waterway for easy access. As a result, the entrance as well as the verandah of the house (in case of a single dwelling unit) faces the river. When the house is not on the water, its front is oriented toward the nearest road.

Evidence from temple murals coupled with archival studies show that the typical farmer's home was a single-entrance dwelling. A content analysis of the traditional Thai home (both single and extended dwelling units) of Chaichongrak (1979)'s collection of the Central Thai houses reveals that about 83 percent of the total of 29 houses are a single entry way dwellings. However, just over 42 percent of the extended dwellings also have a single entrance to the main living platform.

In this study, fifteen out of the seventeen historic houses have a single-entrance. The only entrance to a small dwelling unit, such as most of these houses, is connected from the ground area by a removable ladder.



**Figure 62: Mural painting from Wat Nor Buddhagura, Suphanburi province, displaying the entrance area of a single dwelling unit.**



**Figure 63: A modified farmer's home with a single access stairway to the upper platform**

The ladder is usually made from bamboo or hard wood, and can be drawn up when required. This ingenious design produces a highly controlled access point to secure the home from unwelcome intrusions onto the main living platform while also helping to increase the level of visual privacy for the residents.

For larger homes, it is not uncommon for them to have more than one permanent stairway attached to the dwellings. However, both direct observation and content analysis of the existing records show that in 41 percent of the dwellings, including both extended dwelling units and clusters of connected dwellings, have only a single entry way to the platform that was shared by as many as 6 families.

The stairway landing of modest homes was typically an undefined space. It was neither covered by a roof nor surrounded by the balustrade, and is visually exposed to both the house occupants and passersby. For such homes, a resident on the platform could have easily seen and interacted with visitors or neighbors who ascend the stairway. The larger compound of a well-to-do family's dwelling unit may have had more highly controlled access. In such homes a portal door covered with tiny roof was used to separate the outside and inside of the living platform. This door, which could be locked, was part of the see through fence or balustrade that surrounded the platform.

### **The terrace (Charn)**

The terrace occupies approximately 40 percent of the main platform of the historic home. The terrace's floor level was lower than the rest of the spaces on the platform, and is approximately 30-45 cm. lower than the verandah. This variation in flooring level provided a comfortable seating arrangement for residents to perform various activities.

An open terrace is considered an architectural characteristic unique to tropical regions. It is not covered by the roof, which allows the occupants to receive fresh air within the enclosed space of the house. With some of the larger compounds, the terrace served as an elevated courtyard encircled by three to four living compartments.



**Figure 64: Mural painting from Wat Suwannaram, Bangkok, showing how the terrace (charn) area was used in daily life.**

The large open area of the terrace space is multifunctional, and serves as a major area for the movement of residents to conduct daily social interactions, household chores and other business, where work and domestic related activities occur. In daily life, people may have used this area to dry food, eat, rest, or even sleep. This area was even used to escape the heat for sleeping during the night, but such use was limited largely to male family members. Annually, during the harvest season, the terrace is used for drying the rice crop when the ground is inundated by seasonal rains. For special occasions including domestic or religious ceremonies, this space was used as a banquet area and guest reception area.

Interestingly and consistently, the terrace and the verandah, which were the unique architectural features of the traditional Thai home, are now rarely found in the modified homes. The modified design combines both spaces by constructing an extended roof to cover the whole open area of the terrace, and converts it into a multipurpose hall. The detailed account of the modification, and utilization of the converted area, in the modified homes, is presented in the ‘multipurpose hall’ section.



## The verandah (Ra-bieng)

The verandah is a transition area between the terrace and deeper spaces of the living compartments—the foyer and the rooms. In a typical single dwelling unit, the verandah takes up approximately 20 percent of the main platform. In the historic home, the verandah is typically sheltered by the eaves of the roof extended from the main living unit.

The height of the extended eaves is 1.75-1.80 m above the floor of the verandah, which with the average height of a Thai person during that era was just high enough for a person to walk under without bumping ones head.



**Figure 65: The different flooring level between the terrace and the verandah that serves as a seating area**

[ Source: Chaichongrak (1996) ]



**Figure 66: The verandah are in a museum hous**

### **The kitchen (Krua) and open kitchen (Krua-perd)**

Without the assistance of modern agricultural equipment, rice farming is a labor intensive activity. Most of a farmer's time was devoted to laboring in rice fields away from home. Thus, it was unusual for the Thai farmers to spend a large amount of time cooking in daily life. The only time for extensive cooking was for a special domestic or religious ceremony, but this type of cooking is often done in an open area of the terrace or on the ground space.

Cooking was generally performed by the female members of the family. But there were exceptions and several interviewees concurred that sometime a male family member enjoyed cooking. In a nuclear family, the wife or an older child takes responsibility for food preparation. While in a large extended family, this task is taken over by the more elderly women or a single female relative who serves as housekeeper for the entire family.

In historic homes, the size of kitchens ranges from a small corner area of the verandah, under the eaves of the extended roof, to a more substantial area of 24 m<sup>2</sup>. The

larger separate kitchen compartment used for both food preparation and dining, usually found in an extended dwelling, occupies two post-spans of the main platform.

All of the cooking, in the past, was done on the hearth, which was made of thick layers of hard press soil framed by wood planks. Heat for cooking is provided by wood fire, which can cause a lot of smoke and grime. Without a good air ventilation system, Thai cooking can be pungent and could overwhelm anyone in the vicinity. As a result, whenever possible, the kitchen is located in the separate area from the main living compartment.

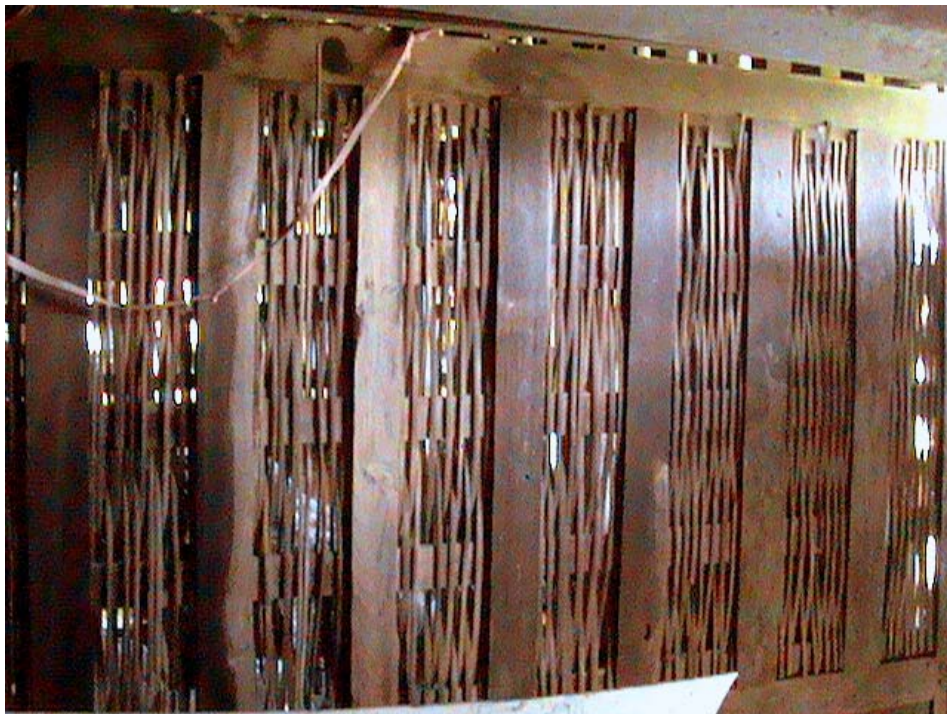


**Figure 67: Ventilation receives top priority in the kitchen of the historic home**  
[Source: Chaicongrak (1979) ]

In terms of the location, the kitchen of the historic house in Central Region is not restricted to the back of the main platform. As previously noted, efficient ventilation is required in the Thai kitchen. The findings from direct observation confirm previous archival records on the use of an interweaving bamboo with the hardwood frame to create a well ventilated kitchen wall.



**Figure 68: Dining area within the kitchen**  
[Source: Chaichongrak (1996) ]



**Figure 69: Wall of the original kitchen remains in one of a modified-traditional dwelling**

Further, the archival study shows the use of slatted gable design for efficient heat and smoke transfer. The kitchen floorings were constructed of bamboo laid with wide gaps to promote air movement and for easy disposal of cooking water. The other half of the kitchen floor is made of stronger and more durable hard wood flooring to be used as a dining area for the whole family.



**Figure 70: Open-air cooking area in a modified home**

Direct observation indicates an increasing use of a combination of both the indoor and the outdoor kitchen in the modified dwellings. The indoor kitchen is used primarily for food storage and light cooking. When indoor plumbing is available, the kitchen is also used as a cleaning/washing area. The conversion of the terrace and the verandah into a multipurpose hall has imposed another undesirable consequence.



**Figure 71: Increasing use of solid wall panels results in inefficient air ventilation in a modified kitchen and the whole dwelling unit**

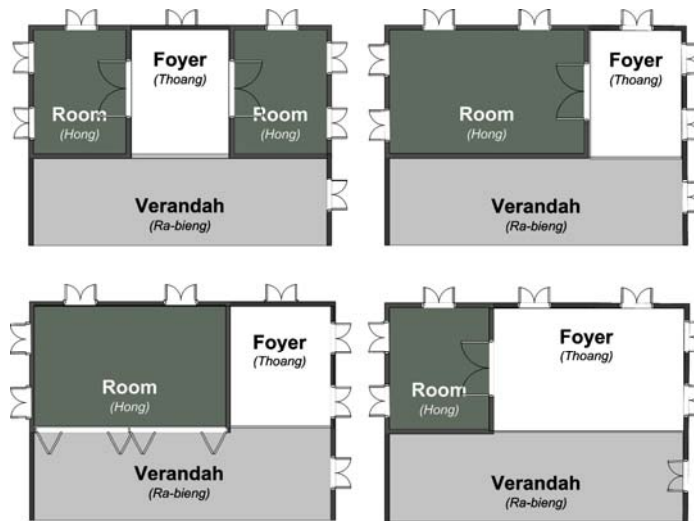


**Figure 72: A view of an open kitchen perched on the extended platform of the dwelling unit**

Kitchen is one of the most important areas in the Central home. In the past, where every family member spent a long day working, the dinner is the only time when everyone could share their meal. As noted by one of the elderly female that, “*We didn’t eat together in the morning, and at lunch we ate in the field...Only in the evening that we got to eat together.*”

### The foyer (Thoang)

The traditional Thai house is composed of several compartments (Ruen) connected by the main terrace platform. Generally, the foyer is used as an entry area for the room(s). The foyer is found in a large number of traditional Thai homes in Suphanburi province where this study is conducted. In some other areas of the central region, such as Ayutthaya, Sing Buri, or Ang-thong province, there may not be a need or a space for the foyer at all. This is because the whole living unit (ruen) is enclosed as one large room that can be accessed through a door that is oriented toward the verandah space.



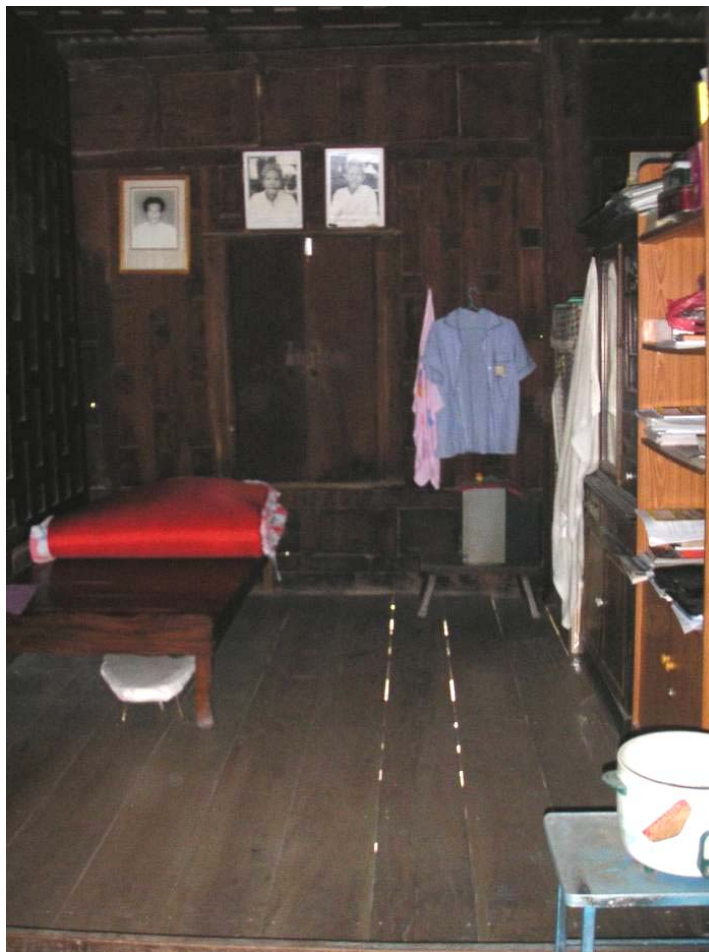
**Figure 73: Various spatial configurations between foyer and the rooms within the living compartment unit**

As the typical living compartment is 1 post-span wide and 3 (bay) post-spans long, the size of the foyer could range from 1 to 2 post-span (approximately 9 to 18 m<sup>2</sup>). The location of the foyer/hall is varied and conducive to modification.

The living compartment walls are made up knockdown wood panels, which make it easy for the occupants to reconfigure the space within the living compartment to suit

their current needs. The foyer-room(s) configuration in the living compartment is flexible (Figure 73). The use of foyer area in historic home is diverse. For some families, it may be used for prayer, a space for a Buddha or ancestral shrine. The foyer is also used as a sleeping area as many interviewees indicated that they prefer to sleep in the foyer than in the room since the area provides a cooler and ventilated space comfortable for resting.

Several elderly interviewees note that, sometimes, the parents would rather have their adolescent daughter sleeping in the room while the parents and other male siblings slept outside in the foyer. The use of the foyer in the modified homes of the farmers in Suphanburi is still as diverse as to those of the past. Buddha and ancestral shrines are still found, and sometimes it is converted into a nighttime sleeping area.

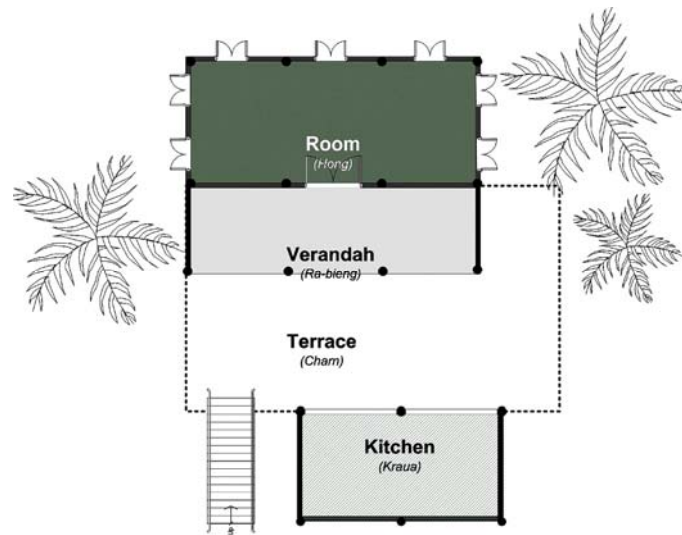


**Figure 74: A foyer that has been converted into a sleeping area in one of the modified homes**



## The room (Hwang)

In the traditional Thai home, the room is located in the deepest and most isolated space within the entire dwelling. The size of this room ranges from approximately 7.0 to 21.0 m<sup>2</sup> (1 to 3 post-span). The content analysis, of Chiachongrak's (1979) record of the traditional dwellings, showed that two thirds of the living compartments were not partitioned into smaller spaces, and usually took up the entire 3 post-span of the compartment. Thus, the room within the historic farmer's home was relatively larger than those found in the modified ones.



**Figure 75: A large room, in the historic dwelling, that usually occupies the whole compartment**

A wealthy aristocrat family might be able to afford to live in a large dwelling compound with several compartments, each for a specific purpose such as for sleeping, common living or praying, the room in a simpler and more practical farmer's home was versatile, and was not necessarily a bedroom. This area was considered the deepest area of the dwelling within which the family's valuable belongings were kept. In this sense, 'family's valuables' included both the material possessions and the family members themselves. As previously noted, sometimes 2-3 unmarried adolescents daughters were to sleep in the room where they are guarded by the parents and other family members sleeping outside.

The interview accounts from both the house occupants and master builders confirmed that visual privacy was not of primary concern for the Thai farmers of the past.

Presumably, the extreme heat and humidity of Thailand's climate had contributed to the farmers' stronger preference for physical comfort over a sense of privacy. Many elderly interviewees admitted that they grew up sleeping in the more open and ventilated area such as the foyer, verandah, or even in front of the kitchen. As one farmer put it, "*Most of the boys slept anywhere they pleased...including on the verandah or the terrace.*" This was probably because "*it was very warm inside the room.*"

Apart from being used as a place for keeping valuable possessions, the room has also been used for different purposes and for special occasions throughout the lifetime of a person. The room was used as a bridal suite for a newly married couple as well as a place for giving birth to a new addition to the family.



**Figure 76: A bed room of a teenage boy in one of the family**

Regard for privacy has become increasingly noticeable in the modified homes. The living unit has been subdivided into smaller compartments. Evidence from direct observation indicates an increasing use of the room as a sleeping area, particularly for younger generations.



**Figure 77: Privacy of sleeping area is still not of primary concern. One of the beds is located in the middle of the multipurpose hall.**

For several families, there is still a trace of the lack of concern for privacy in the arrangement of the sleeping areas, which is displayed by the location of the bed in the middle of the multipurpose hall. But for several others, there is a growing use of household furniture, such as tall cupboards, to partition the area and to increase visual privacy of their individual spaces.

### **Additional spatial components in the contemporary dwellings**

The most obvious and consistent structural modifications, found in these modified homes, include 1) the balcony with seating area, 2) the extended rooftop over the open space of the terrace in the middle of the dwelling, 3) the indoor bathroom, 4) the same flooring level throughout the main platform, 5) the extended enclosure surrounding the open spaces around the compartments. The floor plan layouts comparing the original and the modified dwellings are presented in Appendix C.

The motives for modifying a home are varied. In brief, the reasons include the need to enhance home security as well to increase the ease of using and maintaining the house.

**Table 21: Percentage of modified dwellings with additional spatial categories by type**

Spatial Categories	n	(%)
Balcony	7	(54)
Bathrooms	10	(76)
Multipurpose Hall	13	(100)

Number of Modified Dwellings = 13

The following section discusses the additional spatial categories in the modified dwelling, which resulted from the modification of the original home.

### **The balcony (Muk-na)**

The balcony occupies an area of approximately 6.5-9.0 m<sup>2</sup>, and is located in the front of the dwellings. The balcony, is approximately 2 meter above the ground, and is found in the dwellings with extensive modification. Most of the balcony was converted from the extended living platform upon which the ladder from the ground is rested.



**Figure 78: The balcony, with seating area, serves as the only access to the modified farmer's dwelling**

Usually, there is built-in seating on at least one or two sides of the balcony. Where there is no seating, a balustrade will be added. The balcony is covered by the roof

extended from the main building. The balcony also has a commanding view, and can monitor visitors from a wide angle. It is often used as another place for receiving guests or as another multipurpose area such as for a having meal or relaxation.



**Figure 79: Many of the farmers still prefer to sit on the floor of the balcony while relaxing**

### **The multipurpose hall (Thoang klang)**

The multipurpose hall is either connected to the balcony area or directly adjoined to the stairways from the ground. It is safe to say that this area has been converted from combining the terrace and the verandah spaces together. The floors of both spaces, which used to be approximately 30-45 cm different, have been modified to be the same level.

The eaves of the roof over the verandah have been extended to cover the open space of the terrace. Therefore, spatial differentiation between the terrace and the verandah has been obscured by the merging of both the floor and the overhead planes.

All of the interviewees concur, in that the major reason for building the roof over the terrace and verandah area is for preserving the terrace floor. It is hoped that the shade and shield of the roof will prevent the floor's exposure to the elements that cause

decay. The large and thick hardwood planks that made up the terrace floor are extremely valuable, and either very difficult or too expensive to replace during the present time.

Unfortunately, it is observed that modifications in the modified dwellings have made the house become more uncomfortable to be during the daytime and early evening. This is due to the reduced ventilation and the increased temperature from heat released from the tin roofs that have commonly been used as a replacement for the more organic but less permanent roofing materials, such as vetiver grass, palm leaves, or terracotta shingles.



**Figure 80: The multipurpose hall has been converted from combining the terrace and the verandah under the newly built roof that extended from the eaves of the original compartment**

Another adverse effect resulting from such modifications is the decreased level of natural lighting in the interior of the dwellings. The multipurpose hall of many homes can be uninvitingly dark even during the daytime. As a result, the occupants are

involuntarily forced to stay in other areas of the house such as the ground area underneath the dwelling or the balcony.



**Figure 81: A trace of the verandah area (raised platform to the right of the picture) within the multipurpose hall in one of a modified dwelling.**

### **The washroom (Hwang-nam)**

The Thai word “hwang-nam” is a direct transliteration from the term ‘water closet,’ as the word “hwang” means ‘a room,’ and the word “nam” means ‘water.’ The washroom is considered part of the set of modern amenities, and three quarters of the families in this study have added this feature into their homes. The size of washrooms found in the modified homes ranges from approximately 1.50 m<sup>2</sup> to as large as over 4.00 m<sup>2</sup>. The elements within the modern farmers’ washroom may consist of the wash area, the toilet, and the built-in water reservoir (approximately 1.0-2.0 m<sup>3</sup> in volume).

In the past where the dwellings’ settlement was adjacent to the water source, such as a river, a canal, or a man-made well, the open area around the water source is for washing and cleaning. Additional water may be stored in a terracotta water barrel located





another is aesthetic. The washroom tends to be constantly splashed with water since the family members tend to wash their face and body throughout the day. The poor ventilation coupled with the low level of natural light has caused many of the washrooms to be heavily mildewed and unpleasant smelling. The second problem is that the washroom appliances are structurally heavy and require extensive plumbing. Together, these structural modifications to support the heavy washroom appliances along with the plumbing often spoil the lean and delicate formal design aesthetic of the entire dwelling.

### **Summary**

The spatial organization of the historic home is quite simple and practical. The historic dwelling of the farmers was minimally furnished. The farmers possessed few pieces of furniture. That which they did possess consisted of trunks for storing valuable belongings, and a glass-door cupboard for storing dinnerware or brassware to be used for special ceremonies at home. Most of the activities, such as eating sleeping, or preparing meals, occurred while sitting directly on the wooden floor of the living quarters. When compare its contemporary counterpart, the historic houses tended to have fewer spatial categories.

One of the most utilized areas was the kitchen where all of the family members share their meal together once a day. Other socialized area in the houses included the ground floor, the terrace and the verandah. As privacy was not a primary concern in the past, the room in the houses was used by and large as a storage for valuable belongings while the family members particularly the male and elderly members would sleep outside for better ventilation.

Additional spatial categories in the contemporary farmers' home include balcony, washroom, and multipurpose hall. The balcony was transformed from the original stair landing that connected the raised platform to the ground. The family members increasingly use this area as for rest and relax, and conversing with passerby. The washroom was added as a necessity. However, not all farmers' house in this study has indoor washroom. Table 22 compares the spatial categories and their usage in the historic and contemporary home.

**Table 22: Comparison between spatial categories for the historic and the modified dwellings of the Central Thai farmers**

Spatial Categories	Historic Dwelling		Modified Dwelling	
	Characteristics	Utilization	Characteristics	Utilization
<b>Ground Area</b>	*Open space	*Multipurpose such as family gathering, working, and interacting with neighbor or other community members during the daytime	*More compartmentalized	*Diverse uses, but increasingly for private and family oriented activities, increasing use in the night time.
<b>Terrace</b>	*Open space	*Diverse uses for work related activities such drying crops. *Nighttime gathering *Ceremonial activities *Main circulation area	-	-
<b>Verandah</b>	*Semi enclosed space under the eave of the main living compartment. The area before getting into the deeper space within the dwelling unit.	*Diverse uses such as sitting, rest and relax, dining, or work related activities such as drying crops	-	-
<b>Kitchen</b>	*Semi enclosed compartment *Rapid air ventilation architectural features	*Food preparation and related activities such as storing and cleaning area *Dining area	*More enclosed, and less ventilated	*Less use for food preparation activities, but increasing use as storing and cleaning area *Occasional dining
<b>Open Kitchen</b>	*Ad hoc cooking area either on the ground level or on the terrace	*Cooking for large gatherings or ceremonial activities	*Open space, often located out of sight of the visitors	*Food preparation and cleaning area
<b>Foyer</b>	*Semi enclosed area under the living compartment roof. *Area before entering the room(s)	*Diverse uses such as sleeping area, shrine or prayer area, monks sit in this area during the ceremonial activities.	*Semi enclosed area under the living compartment roof. *Area before entering the room(s)	*Diverse uses such as sleeping, and shrine or pray area. *Increasing use as sleeping area

Comparison between the spatial categories in the historic and the modified dwellings (Continued)

Spatial Categories	Historic Dwelling		Modified Dwelling	
	Characteristics	Utilization	Characteristics	Utilization
<b>Room</b>	*Enclosed by the wall panels of the living compartment unit, and usually have a single access.	*Diverse uses such as keeping valuable belongings, bridal suite for newly wed, sleeping area for unmarried woman, giving birth	*Enclosed by the wall panels of the living compartment unit, and usually have a single access. (Remain the same as the historic dwelling)	*Increasing use as sleeping area for younger generations
<b>Balcony</b>	*Uncommon, if available would not be under the roof *There may be a doorway between the landing and the terrace	*Resting and conversing among family members and passerby	*Converted from the original stairs landing. *Often demarcated by the combination of balustrade and seating, and is usually under the roof	*Diverse uses, but mostly for relaxation and interaction among family members and guests.
<b>Multi-Purpose Hall</b>	-	-	*Converted from combining the terrace and the verandah space together	*Diverse uses for family activities such as family gathering, dining, receiving guests, relaxation, etc.
<b>Washroom</b>	-	-	*Can be located on either or both the ground or upper level of the dwellings	*Mostly a combination of wash area and toilet

## Chapter Nine

### **Analysis of spatial organization**

This chapter presents the spatial arrangement and the utilization of the interior spaces or the “genotype,” which is the dwellings’ less obvious components. The general frameworks used in comparing the spatial organization include 1) categorical differentiation, 2) relative position, 3) sequencing, 4) insulation, and 5) integration.

The raw materials used in the analysis and discussion, in this section, are drawn from the data collected from the artifactual documentation of both the historic and modified home, archival research, survey of mural paintings, and interviews with both house occupants and master builders. Computation of spatial values including the Relative Asymmetry (RA), and spatial Integration (I) have been performed by using space syntax methods. Details of the procedure and limitations of the Space Syntax methodology used in the analytical techniques are discussed in Appendix D.

#### ***Categorical differentiation***

Hanson (1998) defines the concept of ‘categorical differentiation’ as “the extent to which particular functions are assigned unambiguously to specific spaces within the home.” The overall characteristic of the categorical differentiation within the historic home of the Central Thai farmer can be described as ‘homogenous’ and ‘neutral,’ which implies the low intensity and the indistinctive functional assignment of the spatial categories.

The categorical differentiation in the historic and modified houses will be described using two complimentary frameworks—the utilization and the symbolism of spaces. In terms of utilization, when compared to the assignment of spatial function

within the Northeastern Thai dwellings, both the historic and modified homes of the Central Thai farmers are much more practical.

The categorical differentiation of spaces within the historic home displays a relatively egalitarian family structure with minimal gender segregation. There are no space restrictions or reservations for either gender. The activities that occurred within the interior space of the historic home of the Central Thai farmers was endogenously determined by the pragmatic use of everyday life rather than being exogenously imposed by social norms. Accordingly, most of the areas have been used interchangeably.

The explanation for the more versatile use of spaces, in the historic home, may be related to the minimal use of household furniture. Minimal use of furniture leaves the space free for use in a greater variety of activities. Having little in the way of furniture, residents conveniently convert the space to different purposes.

Conversely, for the modified homes, there is an increasing specificity in the utilization of interior spaces of the home. Although the farmers still prefer to perform many domestic activities on the floor, the use of household furniture is growing in popularity in the modified home. The presence of household furniture may contribute to greater specificity of categorization of the area in which it is located. For example, the room has been gradually used as a bedroom for an individual. Beds are placed in the space designated as a sleeping area but not used for other purposes. In addition, farm work is rarely brought over to the house in the modified settings. Most of the rice drying and hulling is finished by using agricultural machinery, and is transported directly out of the field. Thus, the modified home is becoming more of place for domesticity where work and domestic life are no longer intertwined.

Table 5 compares the number of spatial differentiation in historic and contemporary dwellings. The spatial categories from the contemporary dwellings were derived from the combination of the direct observation and interview accounts. It should be noted that, the spatial categories of the historic homes, used in this comparison, were obtained for the most part from the reconstruction of the historic house floor plans. The construction of the floor plan, which the researcher drew up with the help of the house occupants. As such, the spatial categorization of the historic floor was rather an approximation rather than a true measure.

**Table 23: Comparison of total spatial differentiation in historic and contemporary dwellings**

House Number	Total Number of Spaces	
	Historic Dwelling	Modified Dwelling
H01	10	10
H02	7	11
H03	7	8
H04	7	9
H05	7	7
H06	6	8
H08	6	9
H09	7	5
H11	6	10
H12	7	12
H13	6	14
H14	8	9
H15	7	12
<b>Average Number of Spaces</b>	<b>7.00</b>	<b>9.54</b>

**Note: Modified dwellings of H07, H10, MH01, and MH02 are not available to be used for comparison**

While today's family size has been reduced, the need for spatial utilization is increased. Direct observation reveals the expansion of the dwelling spaces both on the upper floor and the ground area. Almost half the houses, in this study, have built an enclosure to the ground area and added utilization spaces such as bedroom, washroom, storage, kitchen and so forth. This increasing need for defined spaces may partially be explained by the lengthier time the farmers spend at home when compared to the past. In addition, with electricity, today's farmers and their offspring have more leisure time in the evenings to devote to socializing, watching TV, reading, or using a computer. Increased leisure time and the types of activities in the home may contribute to the increasing specificity and the elaboration of spatial categories within the interior space of the modified homes.

On the other hand, when considering the cosmology framework, the vertical hierarchy of space could be considered a means for spatial differentiation that is distinctive in the historic home. This type of categorical differentiation was not a reflection of activities related to the space, but rather an embodiment of a large familial structure where the authority structure was emulated. The spatial hierarchy was also a mirror of the concept of 'the sacred and the profane' spaces, which is known to be

pervasive in cultures influenced by Hinduism, such as, Thai culture. In the historic homes of the Central Thai farmers, the ‘sacred’ space was characteristically situated on the highest level of the living quarters, and was reserved for the family members with higher seniority. Lower levels on the platform and the ground floor area constituted ‘profane’ or homogeneous, neutral, non-orientation space which the younger or less senior family members were free to use.

The rural migrations along with the advancements in agricultural technology have contributed to the collapse of extended stem families in the Suphanburi area. The functional requirements of family hierarchy, in a smaller nuclear family, are not as great as in those of the large family units. Differentiation of floor levels, in historic homes that may be interpreted as objectification of family authority have become superfluous and obsolete in modified houses. For smaller nuclear families residing in the modified dwellings, the several spatial types have been consolidated, and transformed into a more egalitarian domestic experience.

In short, the intensity of the categorical differentiation of the space within the original farmers’ homes was relatively low and flexible. Apart from the conceptual principle of vertical hierarchy that was loosely imposed on the categorical, the interior space in the historic home was multipurpose, and the function can be endogenously determined by the immediate needs of the family members. The trace of flexible categorical differentiation of the historic home, to some extent, has survived in the characteristic of the modified home while the vertical hierarchy of the spaces has been diminished due to the shrinking family structure.

### ***Relative position***

The concept of ‘relative position’ focuses on the relationship of spaces, particularly how they are related and connected to each other. It entails the specificity of the position of the spaces within the dwelling, and in relation to the outside world or the exterior of the building.

The relative positions of the rooms in the historic homes did not adhere to the auspicious orientations or religious cosmology factors found to influence the orientation of the Northern or Northeastern farmers’ dwellings (Sparkes, 2005). In the Central

Region the relative cosmological position of the rooms or spaces within the historic dwellings was unimportant.



**Figure 83: Location of the kitchen in historic homes**

Chongchairak and colleagues (2002) noted that, for practical purpose, the historic house and its entrance would be oriented toward the main path of traffic into the community such as the river or the major roadway. The interior/exterior relation of the historic home indicated a community friendly design that encouraged casual interaction between neighbors or passersby. The orientation of the historic home along with the insulation characteristics of the dwelling's shell indicated a more community oriented domestic arrangement when compared to the modified homes.

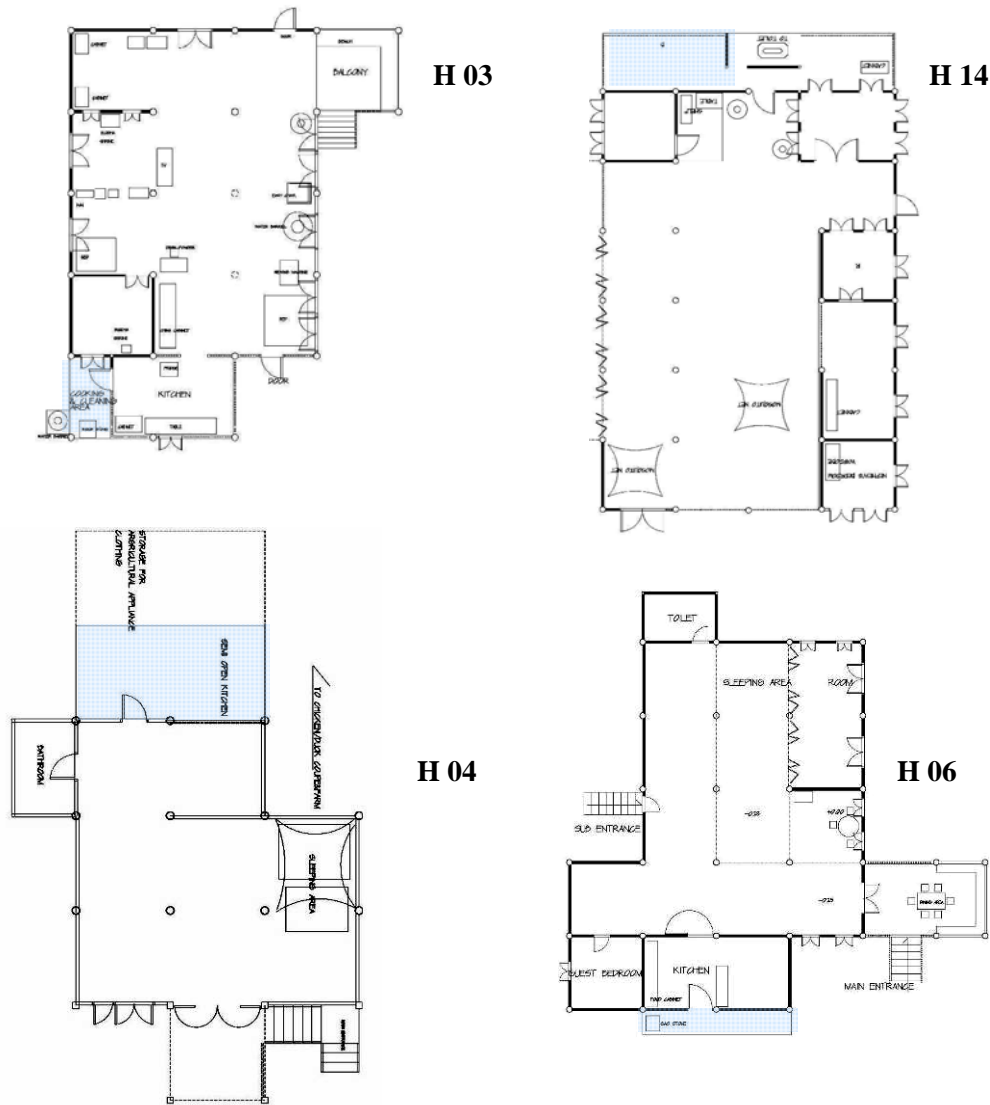


The evidence from both the archival study as well as interview accounts revealed that the location of the kitchen, where female family members spent most of their time preparing food for the family, could be accessed from the terrace and could be seen directly from the entrance. From this it might be inferred that the cooking as well as the area for women was not regarded as unsightly or in need of being hidden away. It was not unusual for the kitchen to double as the dining area, and to be used as a place for receiving guests. As noted, historically, farmers spend most of their time in the field, and had to keep their lives practical. When it comes to entertaining, there was not much formality or protocol. Joining the family feast is considered a relationship strengthening activity for both guests and the hosts. This cultural practice reflected the traditional conversational style, which is no longer present in urban areas, wherein people would greet guests with, “*Where have you been? Have you had rice yet?*” as meal sharing was used as a means of conveying hospitality and friendship. Thus, the kitchen was considered an important part of the historic home.

The orientation of the modified homes is similar to that of the historic ones. That is the front entrance of the home faces the major transportation route, but the dwellings have been modified to be more enclosed. The interaction between the occupants and the community is severed by a solid wall that serves as a visual boundary.

The findings reveal consistent orientation of the open kitchen as well as the washroom, the additional features in the modified dwellings, in the area toward the back of the house. This constitutes a contrasting practice and perception of the kitchen space between the historic and the modified dwellings. The kitchen of the historic home may be positioned toward the front entrance or where the activity within could be easily seen by anyone located on the living platform. In contrast, the farmers inhabiting the modified houses feel that the open kitchen and the washroom areas are to be hidden away from the sight of the visitors.

In brief, the position of the entrance area, from the outside world, in both the historic and modified home has remained unchanged. However, the reduced visual permeability of the modified dwellings’ enclosure impedes casual interaction of the occupants with the other community members in the vicinity.



**Figure 84: Location of the open kitchen in the modified houses**

This characteristic coupled with the aforementioned arrangement of the open kitchen and the washroom is indicative of a greater isolation and self-conscious view of the modified homes' occupants when compared to those of the historic houses.

### ***Sequencing***

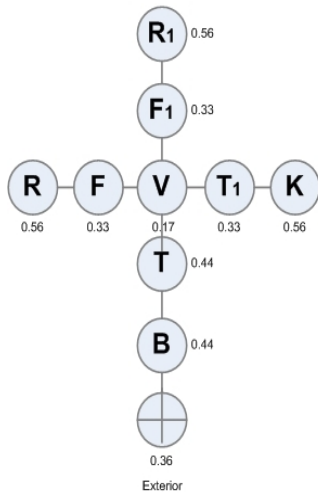
Hanson (1998) clarifies that the sequencing concept is concerned primarily with the adjacency and circulation patterns within the dwellings. It deals with spatial connections, just as the aforementioned concept of 'relative position,' but the emphasis is placed on the connection pattern of the spaces.

In terms of circulation, both the historic and modified dwellings are similar. The movement into the spaces within most of the dwelling units is controlled and monitored visually by the single entry design. There was no way out of the dwelling unit except to return to the point of origin by tracing the same route. However, the justified graphs (Figure 85, Figure 86, and Figure 87) reveal the inherent differences in the spatial arrangement within both types of dwellings. The spatial arrangements within the modified homes display a less linear connection than that of the modified ones.

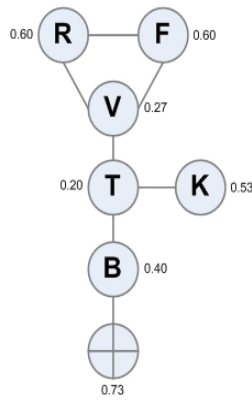
The terrace area, in the historic home, which was the shallowest space from the outside, was to first area to be entered by a person ascending to the main platform. It consistently served not only as a multipurpose area, but also as the main traffic area of the house. The terrace, and verandah, and the foyer areas served as buffer space prior to the change, or to prime, the experience before one moved towards areas with different spatial hierarchy. One has to move through at least two to three buffer spaces in order to enter the rooms which were usually located in the deepest space within the dwelling compartment.

In addition, there was a contrasting experience of the level of exposure to the elements as well as the different flooring level when one moves through spaces within the historic home. The shallow space of the terrace was open to the elements. Next, the verandah, which was located one step away from the main circulation, is still a semi-open area, but was on a higher floor level and covered by the eaves of the extended roof. The kitchen, usually in the same depth as the verandah, was sometimes on the same floor level with the terrace, but sheltered by the roof, and protected by a semi-enclosed/ventilated wall. And for the deepest area, which was the room, was on the highest floor level, and enclosed by both the wall and the roof. Thus, from this description, it was safe to say the movement from the main circulation of the home toward the inner space was a movement from open ground toward higher protected shell.

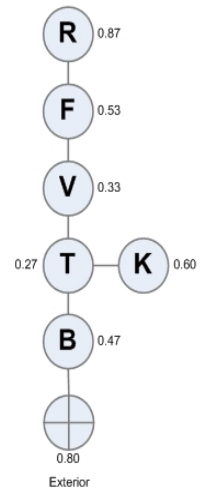
## Historic Houses



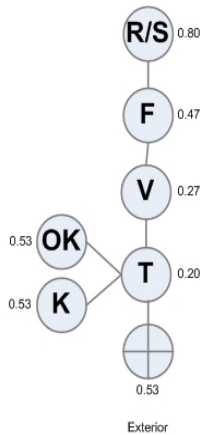
House 01: Historical (RA)



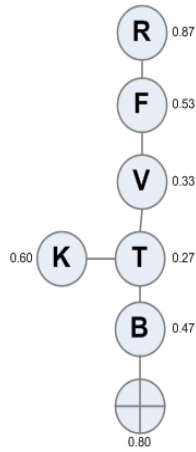
House 02: Historical (RA)



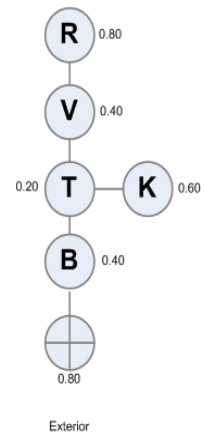
House 03: Historical (RA)



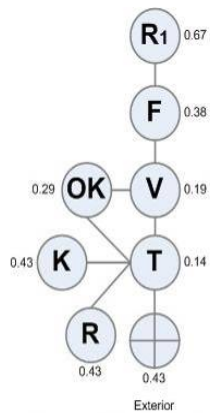
House 04: Historical (RA)



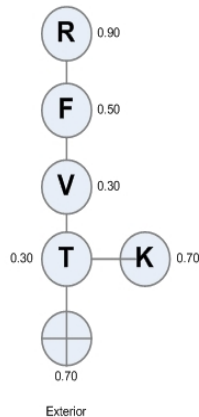
House 05: Historical (RA)



House 06: Historical (RA)

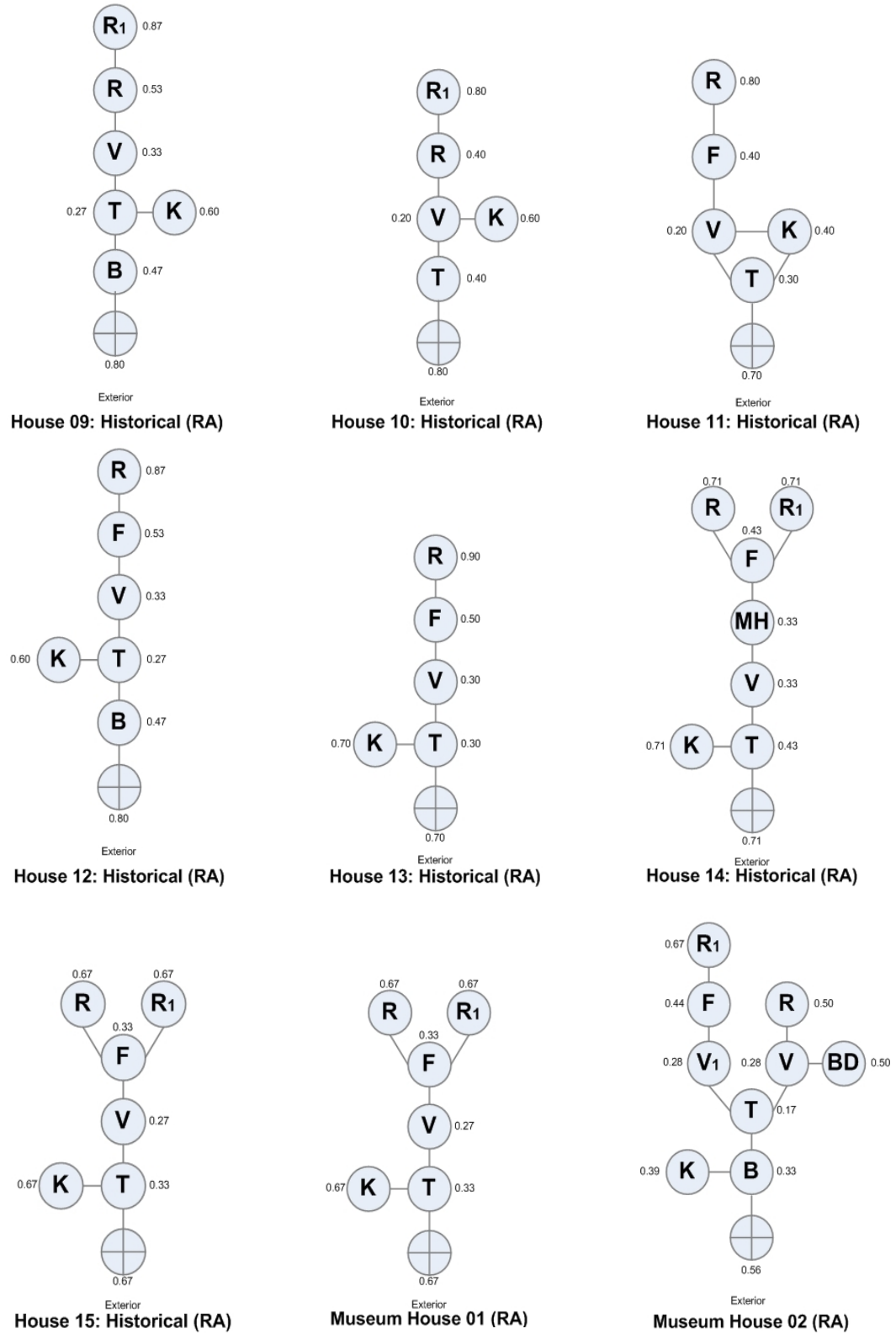


House 07: Historical (RA)



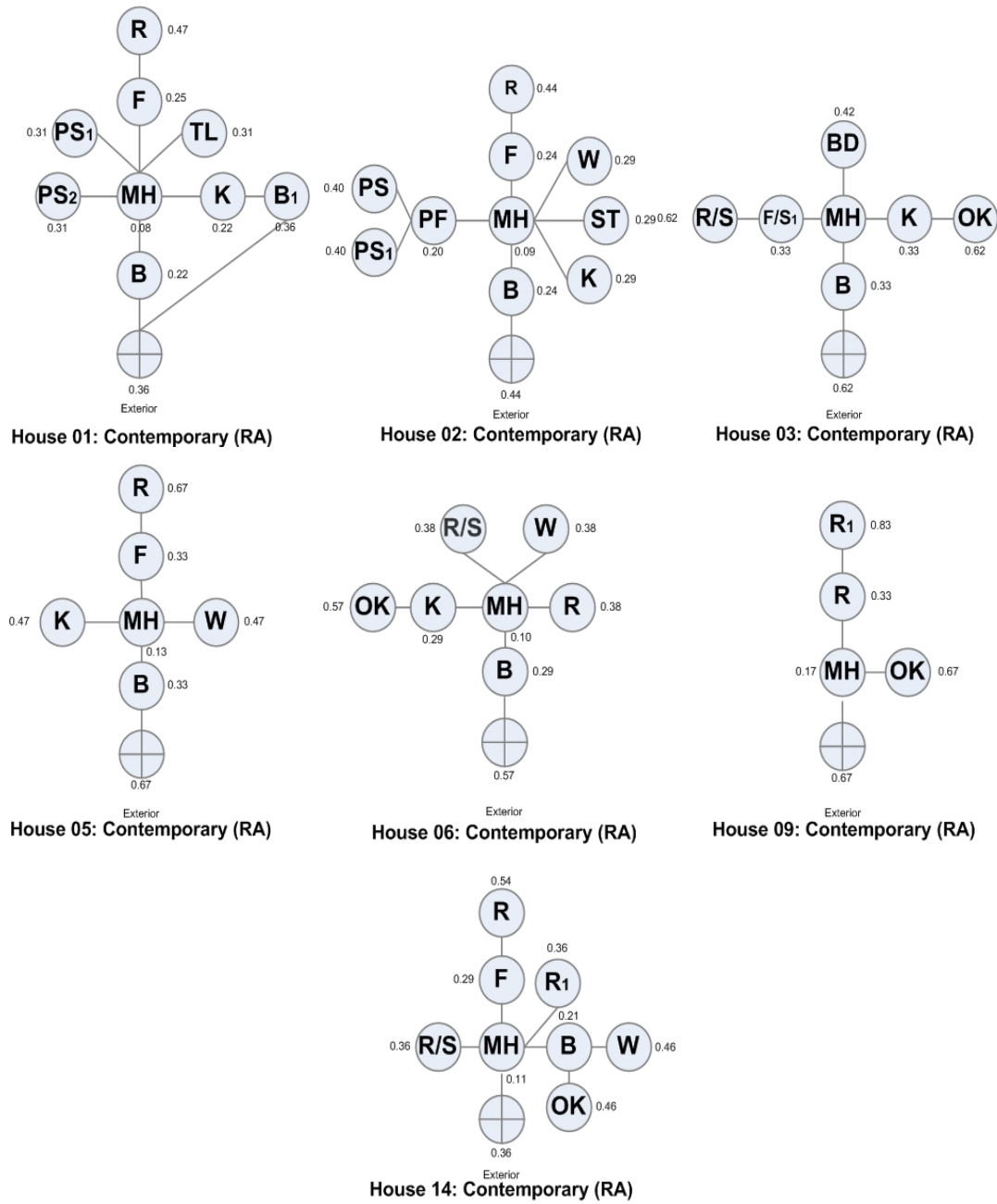
House 08: Historical (RA)

**B** = Balcony  
**BD** = Buddha Shrine  
**F** = Foyer  
**K** = Kitchen  
**OK** = Open Kitchen  
**MA** = Multipurpose Area (opened)  
**MH** = Multipurpose Hall  
**PS** = Partitioned Sleeping Area  
**R** = Room  
**V** = Verandah  
**S** = Sleeping Area  
**ST** = Storage  
**SW** = Stair Well  
**T** = Terrace  
**W** = WC



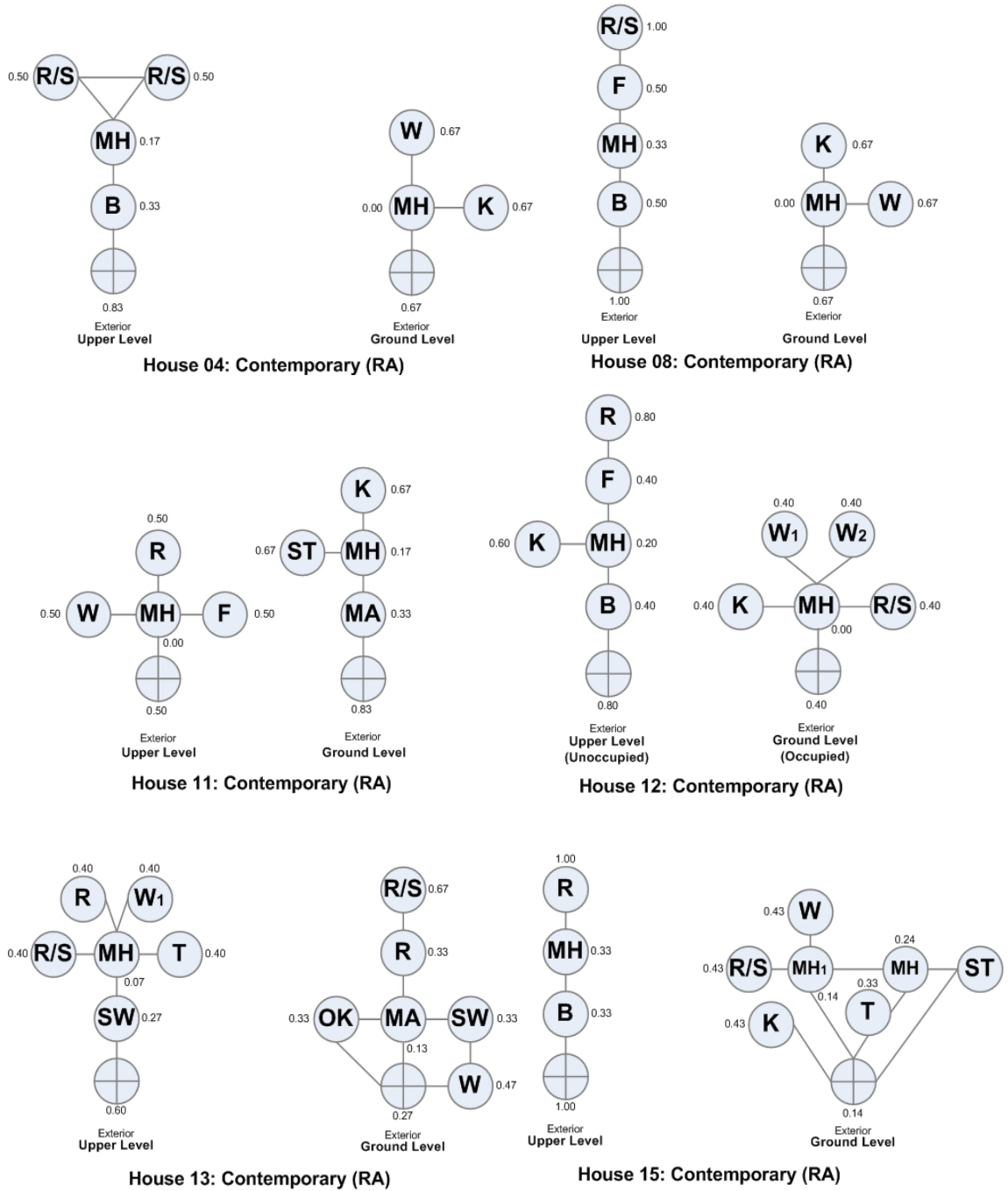
**Figure 85: Gamma graphs of spatial organization of the 17 historic dwellings (H01-15, MH01-02) with Relative Asymmetry (RA) value**

## Contemporary Houses: Single Storey



**Figure 86: Justified graphs of modified spatial arrangement in single storey contemporary dwellings with Relative Assymetry (RA) value**

## Contemporary Houses: Two-Storey



**Figure 87: Justified graphs of modified spatial arrangement in two-storey modified dwellings with Relative Asymmetry (RA) value**

The conversion of terrace and verandah into a large multipurpose hall has reduced the depth of the rooms and the kitchen unit. The room is now only one or two steps away from the main circulation route. Most of the spaces within the dwelling unit have now clustered around the multipurpose hall (MH) area. Connections between the once deeper spaces such as the rooms within the house have become shallower as the buffer areas, such as the terrace and the verandah, have been eliminated. Not only the rooms and kitchen spaces have become shallower, but the varying flooring level and the enclosure are no longer present in the modified room.

### ***Insulation***

The term ‘Insulation’ refers to strength of the boundary between rooms or spaces. The degree of ‘insulation’ depends on the type of barrier created between two different categories of spaces. Hanson (1998) notes that a high degree of insulation can be described as rooms that are not only separated by walls, but also by the furniture that line up against the wall as additional reinforcement. On the contrary, a low degree of insulation entails an area separated by a railing, or differentiation of floor levels or ceiling heights. Though Hanson’s original concept of ‘insulation’ is limited to the interior space of the dwelling, the concept of insulation can also be used to analyze the spatial characteristics of the traditional Thai home in its entirety, which will include both 1) the interior-exterior, and 2) the interior-interior spaces.

The interior-exterior insulation in the historic home was much lower than that of the modified ones. The information from temple murals, archival research, and interview accounts also support this description. The boundary of the living platform served to separate the outside world and the inside of the dwelling. This platform might or might not be enclosed by a visually permeable fence, which encouraged casual interaction between the house occupants and the neighbors in the surrounding area.

During the past 30 years, advanced agricultural technology along with land development has allowed the farmers to earn more income, and work more efficiently with minimal labor required. The need for community help in farming is no longer essential. Farmers have become more independent financially and professionally. Many farmers moved away from their original settlement along the river when they could



afford to do so. Thus, the community spread out and many families settled in more isolated areas away from their well known relatives. Safety concerns have become one of the top priorities to consider in house design. Additionally, size of the house has been considered as a status symbol. One possible interpretation is a larger home is a function of what people can afford. The size of the house is counted by the number of the post-spans of the living compartment. The more post-spans the living compartment covers, the wealthier the family is perceived to be. Often farmers will enlarge their house as soon as they have the means to do so.

The aforementioned factors result in a higher degree of interior-exterior insulation in the modified homes. The occupants permanently fortify the main living platform with solid wall panels as a means to prevent the intrusion of robbers as well as to maximize the interior space of the house. Thus, the platform has turned into a large enclosure where no interior-exterior visual connection is permitted. The larger and well protected interior space of the modified farmer's home has been achieved at the expense of an exterior-interior visual connection (low degree of interior-exterior insulation) of the historic home.



**Figure 88: Balustrade, different flooring and ceiling level are commonly used for defining area in the historic dwellings**

The insulation within the interior spaces of the historic home was presumably much lower than that of the modified ones. The use of walls to create an enclosed space was limited to areas such as the individual room or rooms, and the kitchen. The interview accounts and archival research indicate that there were only a few pieces of furniture in the historic home such as trunks for keeping clothes and valuable belongings. It was unlikely that these few pieces of furniture were used to create or enforce a boundary between spaces. Thus, the boundary between spaces in the traditional Thai home is defined by the dwelling's architectural features such as the different floor and roofing planes, or balustrade.



**Figure 89: The increasing use of tall furniture to partition an individual space from the family's main circulation area in modified home**

Interestingly, while the numbers of family members per household has been declining, evidence from direct observation and interview accounts with house occupants and master builders indicate an increasing need for visual privacy of the occupants. The farmers reported an increasing use of household furniture such as closet, cupboards, bed, living room set, and TV cabinet in the farmers' household. And some of this furniture serves a double function as a partition to subdivide the large open space, and to gain privacy for the individual areas, and to substitute for architectural elements used as

spatial demarcation that have been obliterated through the modification of the modified home.

When compared with the historic home, the degree of interior-to-interior insulation in the modified homes is much higher, and the types of barriers used in creating the spatial boundary are more permanent and rigid when compared to the knock-down, and reconfigurable walls using in the historic home. In the houses where the ground area has been modified, the walls around and within the area are made from brick and mortar, and cannot be modified as easily as those in the historic home.

In summary, the degree of both the exterior-interior and interior-interior insulation in the modified homes is higher than that of the historic homes. The higher level of exterior-interior insulation suggests the safety concerns and the farmer's perception of the house as a status symbol. The stronger interior-interior insulation in the modified home is indicative of a compensation for the vanishing spatial boundary created by the architectural elements, and an indication of an increasing need for individual privacy among family members.

### ***Integration***

Spatial 'integration' and 'segregation' entail the quantifiable spatial variables produced mathematically by using Space Syntax analysis (Hillier, 1984). Two types of Space Syntax variables namely 'Relative Asymmetry' (RA) and 'Spatial Integration' are used in describing spatial relationships within the home (see formulas and a detailed description of these analyses in Appendix D). The 'Relative Asymmetry' and the 'Spatial Integration' values allow the spaces within the dwelling to be expressed and compared quantitatively, and can be used to reveal the genotype—the hidden pattern of spatial connection within the dwellings.

When comparing the historic against the modified version of the same dwellings, the mean integration values of the modified homes are slightly higher than that of the historic ones. This overall change is due to the merging of terrace and verandah into the multipurpose hall in the modified home, which increases the integration value of the other spatial categories within the home.

Despite structural modification in certain modified dwellings, the spatial analysis reveals that the overall spatial patterns of the modified dwellings are relatively similar to that of the historic home. That is the spatial pattern within the dwelling is organized around the center of the house. In the historic home, the most integrated, and considered strategic location of the house, is the terrace. In the modified dwellings, the most integrated area is multipurpose hall, itself a conversion combining the terrace and the verandah together. Thus, other spatial categories in both historic and modified homes could be considered offshoot spaces of these strategic locations.

This surviving spatial pattern reflects the nature of interactions among family members that have not changed much over time. The terrace in the historic home or the multipurpose hall in the modified home serves as the control space where, all of the family activity occurs, and every movement can be fully observed without any obstruction. This central feature suggests that the spatial pattern in the dwelling has continued to serve as a basis for a highly cohesive family where every member conducts social activities together.

In terms of the exterior-interior connection, the exterior of both the historic and modified home is segregated from the inside of the dwellings. The access to both the historic and modified dwellings is well guarded and controlled through the use of a single entry design. No one is able to go to the deeper area in the house undetected. However, when considering the enclosure of the historic dwellings, the see-through enclosure or the lack thereof, more visual contact with the surrounding environments is permitted in the historic dwellings than the modified ones. The increasing use of a solid enclosure in the modified home has made it completely cut off from the outside world, thus, ever more isolating the inside of the home from its surroundings, a finding which corresponds with the analysis in the previous chapter.

The average integration value of the 'rooms' in the both the historic and modified homes are consistently lower than that of the other area of the dwellings. This means that the rooms are isolated from the rest of the house. In the historic home, the rooms are not always used for sleeping, but for keeping valuable belongings or to serve temporarily as private space during important occasions. Today's preference for privacy among the farmer's family has been shifting from that of the past. The isolated location of the room

perfectly serves the increasing need for privacy as the rooms in many modified dwellings have turned into sleeping areas for the younger generation.

**Table 24: Comparison of Integration values (I) with exterior between historic and modified dwellings with single storey**

House Number	Historic				Modified			
	Number of Spaces	Space Syntax Integration Value			Number of Spaces	Space Syntax Integration Value		
		Mean	Min	Max		Mean	Min	Max
H01	10	0.85	b=k=f=r2 0.46	v 1.84	10	1.30	r 0.65	mh 3.67
H02	7	0.87	ex 0.46	t 1.70	11	1.19	ex=r 0.66	mh 3.32
H03	7	0.72	r 0.39	t 1.27	8	0.95	ex=ok=r/s 0.53	mh 2.3
H05	7	0.72	r 0.39	t 1.27	7	1.01	ex=r 0.51	mh 2.55
H06	6	0.82	ex=r 0.44	t 1.75	8	1.18	ex=ok 0.57	mh 3.44
H08	6	0.73	ex=ok 0.53	t=v 1.16	5	0.63	ex=r/s 0.35	mh 1.06
H09	7	0.72	r1 0.39	t 1.27	5	0.93	r 0.42	Mh 2.11
H14	8	0.67	ex=k=r=r1 0.46	v=mh 0.98	9	1.13	r 0.59	Mh 2.96
<b>Average</b>	<b>7.25</b>	<b>0.76</b>	<b>0.44</b>	<b>1.40</b>	<b>7.87</b>	<b>1.04</b>	<b>0.53</b>	<b>2.68</b>

## Summary

This chapter examines the transformational pattern of the genotype or spatial organization in the traditional Thai home as a means to 1) determine if there are common patterns for the spatial organization of traditional Thai dwellings, 2) to examine whether there has been any change in the spatial organization of the original and the modified dwellings, and 3) to learn of intrinsically useful features in the traditional Thai home that can be used to provide the design guidelines for the modified home.

**Table 25: Comparison between spatial characteristics of the historic and modified dwellings**

	<b>Spatial Characteristics</b>	<b>Historic Homes</b>	<b>Modified Homes</b>
<b>Differences</b>	<b>Spatial Differentiation</b>	Homogenous and more flexible spatial utilization Fewer spatial categories	More elaborated and increasingly specific spatial types Increasing number of spatial categories
	<b>Sequencing</b>	Highly lineal sequencing Uses of buffer spaces to indicate transition area	Clustered toward the center—the multipurpose hall
	<b>Insulation</b>	Low level of insulation. Less visual privacy as trade off for community connection	Higher level of insulation both exterior-exterior, and interior-interior insulation Higher isolation from the surrounding environment
<b>Commonalities</b>	<b>Relative Position</b>	Oriented toward the community's main transportation route	Similar to that of the historic dwellings
	<b>Integration</b>	The terrace and the verandah are the most integrated spaces Exterior and the inner rooms are the most isolated area in the houses	Relatively similar to that of the historic home—the multipurpose hall, which is converted from the terrace and the verandah, is the most integrated space

Table 25 shows the commonalities and differences of spatial patterns found in both the historic and modified homes. In short, the spatial organization of the historic home displayed a character of a utilitarian dwelling where work and domestic life were intertwined. The orientation of the dwellings and the spatial categories within were less likely to be imposed by religious cosmology, but rather by the need for social contact and optimum utilization. The spaces within the historic home can be used for diverse purposes. The interior-interior or interior-exterior visual privacy was not of primary

concern. Visual permeability was part of an important feature that enables interaction between the occupants and the neighbors in the community where the barter system and labor exchange were still prevalent. However, farmers used a single dwelling access design as a means for security and control.

The common spatial characteristics of the modified dwelling are somewhat different from the historic one. With advanced agricultural technology and a vastly different system of labor exchange where community and kin relationships have been supplanted by wage earning temporary farmhands, for today's rice farmers work is relatively severed from domestic life and community life. Likewise, these changes in agricultural practices and the amenities associated with rural electrification afford farmers more opportunity for leisure time at home. Home becomes a place of sanctuary. It seems the longer hours, the farmers are able to spend at home, the more elaborate their homes have become. The analysis of spatial organization shows that, although the number of family members in today's farming family is much smaller, the total interior space of the home has been increased when compared to the homes of 50 years ago. The occupants maximize the interior spaces by augmenting the walls and roof around the terrace and the verandah space that used to be exposed to the elements. Some modern conveniences such as washroom and indoor plumbing have been added to the dwelling to make life more comfortable. Evidence shows an increasing ownership of household furniture, although sometimes these are left unused.

The increasing amount of time at home for modern day farmers may lead to a need for more privacy at home, which is indicated by the higher degree of interior-to-interior insulation. Within the house, evidence shows the stronger degree of barrier, especially the use of household furniture to create boundaries between the individual and family spaces.

Other distinctive spatial characteristic of the modified home include the higher level of exterior-to-interior insulation. As noted in the previous section, the change of the dwelling location from the denser cluster of housing in the original hamlet to a more remote and isolated homestead, coupled with other social change factors may have contributed to an increasing need for domestic security. There are fewer watchful eyes of



neighbors and relatives, and those few who stay at home are the elderly. It would be best not to tempt thieves with material possessions that can be easily seen and accessed.

The common spatial characteristics among the historic and modified homes are the 'Relative Position' of the interior of the home to the outside world and the over all spatial 'Integration' of the spaces within the dwellings. In terms of the 'Relative Position,' the historic dwellings were oriented toward the major water way, and the modified dwellings (which have been moved further in land) are oriented toward the road, but both types of the dwellings have a single access to the outside world that is oriented toward the community's major transportation route. This simply shows the emphasis of the use single access as a controlling strategy as well as a practical usage.

In brief, the comparison of spatial characteristics between the historic and modified homes of the Central Thai farmers enable us to learn of how the occupants have adapted their older home to best suit their current needs be they social or physical. Several modified features tell us the changing needs in the different social environments, such as the increasing need for individual privacy among family members, the need for modern comforts such as a washroom and indoor plumbing.

Other modified features may serve the occupants social needs. This includes the maximization of the interior space by augmenting the enclosure around the platform and the ground floor that reduces ventilation and natural light within the interior space of the home. This also increases the need to create an additional open kitchen to prevent trapping smoke and strong smells, which would otherwise permeate throughout the entire house.

The spatial features retained, such as the organization pattern of space implies the surviving spatial pattern reflects the nature of interaction among family members, which suggests that the spatial organization in the traditional Thai dwelling has continued to serve as a basis for a highly cohesive family where the spatial pattern encourages encounter and interaction between occupants in the home.

## Chapter Ten

### **Underlying principle of house form transformation**

The objective of this chapter is to discuss the transformation of the physical properties of the houses in relation to the aforementioned domains of Place Experience. It aims at explicating the underlying principle of house form transformation pertaining to the overarching inquiry for this research: **“How have the Place Experience including the physical characteristics of the traditional house in the Central region of Thailand been transformed in response to a changing socio-cultural environment?”**

This chapter compares and contrasts the overall features of the historic home with the modified home by using the theme derived from the information from content analysis of the interview transcripts, survey of temple murals, archival research, direct observation, and artifactual documentation.

### ***“Dynamic and Flexible” versus “Static and Permanent” Construction***

The historical home of Central Thai farmer’s dwelling was, indeed, very dynamic both in construction and form. The dwelling could be easily modified to fit the needs of its occupants. In the past, the family dynamic of farmer’s household had a strong influence on the construction of the dwelling. The house might grow larger or become smaller depending on the changing family size. The flexible construction technique of the wall panels allowed the living compartment to be rearranged to fit differing family requirements. In addition, the dwelling could be split in parts, for parents to give only a portion of the structure to their offspring. When the family needed to relocate, the house

could be easily transferred to the new site since the construction material was made of a relatively lightweight material.

Both the construction material and the structure of the modified houses are more static and permanent when compared to the older versions. More durable and less forgiving construction techniques and material such as brick and cement have been increasingly incorporated in the new part, or in the reinforcement of the existing structure of the home. This has made the house become less dynamic and adaptable.



**Figure 90: Another example of the modification in contemporary home**

Usage of the rooms and living compartments has become more fixed. House occupants indicate that there is no longer the practice of living compartment reconfiguration or splitting the house to give away to relatives. Relocation is also no longer possible with the houses that have been reinforced with brick and concrete such as the one in Figure 90.

### ***“Hierarchical” versus “Integrated” space***

The historic house was not just a presentation of unity, but also of a different kind of hierarchical subdivision. Vertical hierarchy of space in a historic home was

distinctively different than that of a modified one. Although living compartments in the traditional Thai house rested on one large platform, there were at least three to four floor levels within the platform. Each level was approximately eight to twelve inches apart in elevation. In an older house, the highest floor level would house small rooms within the living compartment.

Vertical hierarchy of spaces in the design of a historic home not only created variation in spatial quality, but also provided orientation and meaning of spaces within the dwelling. As noted by Levi-Strauss (1982), the spatial organization of the house reflects fundamental social and cosmic distinction; the house is both a model of the cosmos and a representation of the position in the community and how it is perceived by the outsider.



**Figure 91: Vertical hierarchy of space, in the museum house, also serve a practical purpose of differentiate living quarter from the terrace.**

The concept of sacred-profane'<sup>4</sup> (Duangviset, 1996; Eliade, 1957) can be used in elaborating the relationship between the vertical hierarchy of space and the domestic practice to some degree. In the historic home, the 'sacred' space is characteristically situated on the highest level of the living quarters, which signifies the axis—the area where the worlds of humans and spirits meet. Lower levels on the platform and the ground floor area constitute 'profane' or homogeneous, neutral, non-orientation space where the chaos of daily life occurs.

The highest space on the platform is the room within the living compartments. The room was well protected and situated in the deepest space of the house. In most of the houses, this room was not for sleeping, but instead it is used as a worship place for Buddha, ancestors, and some other Spirit Religion idols. The room would only be occupied by the family members in some important occurrences such as for giving birth or used by newlywed couple as a temporary bridal suite. However, in some cases, this room would be used as a sleeping area for adolescent daughters where parents would sleep outside guarding the doorway.

The lower part of the dwelling such as the verandah, and terrace, and ground area could be considered space that is lived in or 'profane.' These spaces were more open, easy to access than the inner rooms. The verandah was located in an adjacent area to the inner rooms, and was sheltered by the eave of the roof that extended from the living compartment. Lower than the verandah was a terrace. The terrace was also the shallowest area as it could be accessed by a person ascending to the upper platform. This multipurpose space, that was not covered by the roof, and was used for living, working or conducting other social activities. Lower than the terrace was the kitchen. In the historic home, the kitchen occupied its own compartment separated from the main living quarters, but still connected to the main platform. The lowest part of the living space was the ground area underneath the platform. This area was also used as a multifunction space

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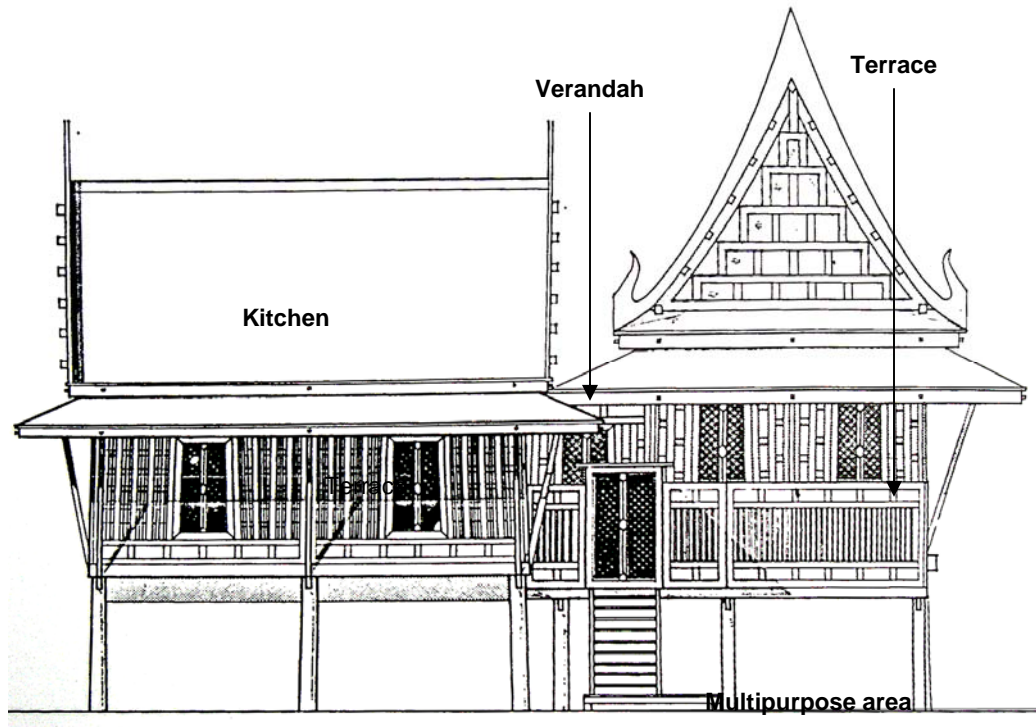
<sup>4</sup> The vertical hierarchy of space in the Thai dwelling can also be linked to the notion of the Indian 'Tantrikas' that perceives human body as universe (Bhawan, 1986) where the vertical elements of body are seen to align with spinal axis of Mt. Meru. In this sense, the highest place in the body is considered the most 'sacred,' and the lowest place in the body is regarded as 'profane.' Strongly influenced by Hinduism, Thai people take this concept seriously. As such, the floor where the residents sleep and rest their head (sacred) must be raised higher than the profane area where they walk (feet level) around and conduct day-to-day activities.

for keeping small animals or for people to work, rest, and socialize during the day time. The vertical hierarchy of space, from the highest to the lowest levels, typically presented in the historic home is displayed in the following table.

**Table 26: Vertical hierarchy of space in historic home ranging from the highest to the lowest level**

Level	Area	Function
<b>The Main Platform</b>	<b>1. Inner room/s</b>	Worshiping, Keeping Valuable Belongings, Sleeping area for a special purpose
	<b>2. Verandah</b>	Resting, Relaxing, Socializing
	<b>3. Terrace</b>	Multipurpose
	<b>4. Kitchen</b>	Cooking, Dining
<b>Under the Platform</b>	<b>5. Ground area</b>	Multipurpose

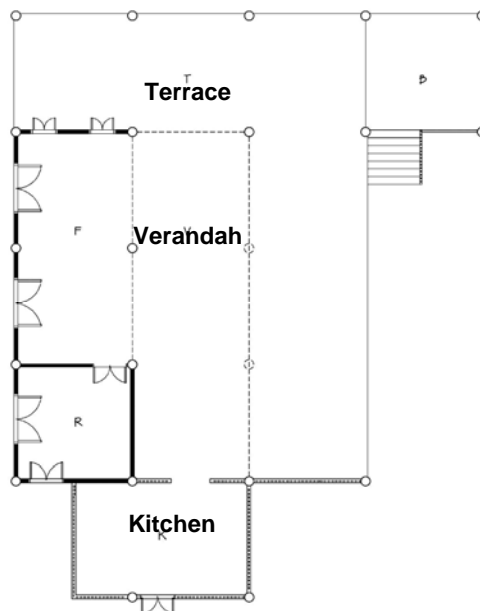
Use of vertical hierarchy of space has been disappearing from the contemporary farmer's home. The verandah and terrace which were characteristic of a traditional Thai house were no longer present; as they were consolidated into one large leveled platform. Without a vertical hierarchy that serves to differentiate the quality of space, the notion of the 'Sacred-Profane' within the dwelling has also been obliterated.



**Figure 92: Elevation of the Thai house**  
[Source: Chaichongrak (1997)]

Space in a contemporary home of a farmer has been integrated, and become more egalitarian. From the standpoint of the interviewees, this loss of vertical hierarchy is occurring from a practical standpoint because people find a single level is easier for cleaning and moving around. As a socio-cultural explanation, as family gets smaller the issue of hierarchy in family are less dependent upon ritual and symbolic objectification.

In relation to the fading ‘sacred-profane’ concept, changes of lifestyle and arrangement of household items are observable in the new spatial configuration of the dwelling. The inner room has been increasingly used as sleeping area for the younger generation, while the shrines have been exposed to the open area indicating the fusing of sacred and lived space in today’s home.



**Figure 93: Floor plan layout of historical home (H03)**

In a modified home, vertical hierarchy has been replaced by horizontal integration of space. This horizontal integration appears on two dimensions—the floor and the roof plane. The roofs in the contemporary home are extended to cover the former verandah and terrace spaces, unify them into a large all purpose living area, and result in a differing quality of spatial experience.

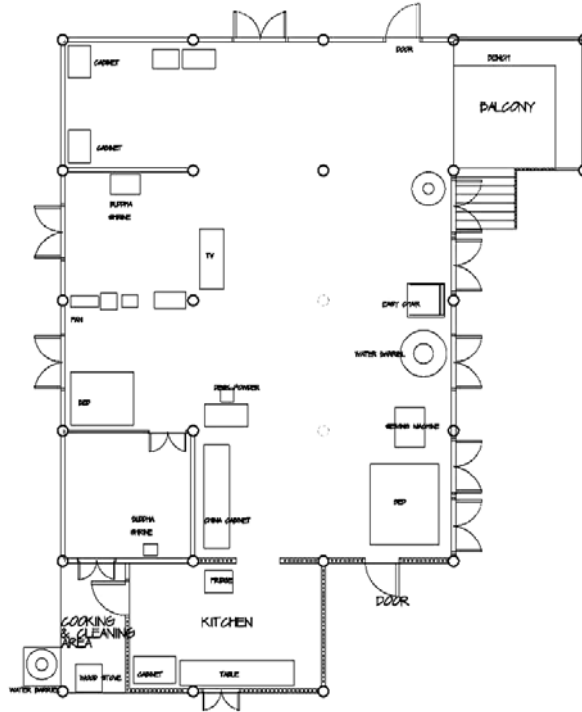


**Figure 94: Disappearance of vertical hierarchy of space in contemporary home**

The Interview respondents indicate the preference toward a larger living compartment with one large floor plane. The need for larger interior space may be due to two significant factors. Firstly, the residents may regard the size of the house as a status symbol—the larger the better. The second factor is owing to the growing need to use indoor space during the nighttime. Since the introduction of electricity and television, some activities such as watching TV or reading have been added to the farmer's daily/nightly routine. During the day, the residents still prefer to spend time on the ground under the main living platform as was done in the past.

The farmer did not spend much time at home during the farming season (once a year), but more during the off season. Farmers today spend most of their time out in the field, but yet their houses grow much larger than that of their ancestors. Carsten and Hugh-Jones (1995) observe that “the source of symbolic power of the house does not reside in the house as an isolated entity, but in multiple connections between the house and the people it contains.”



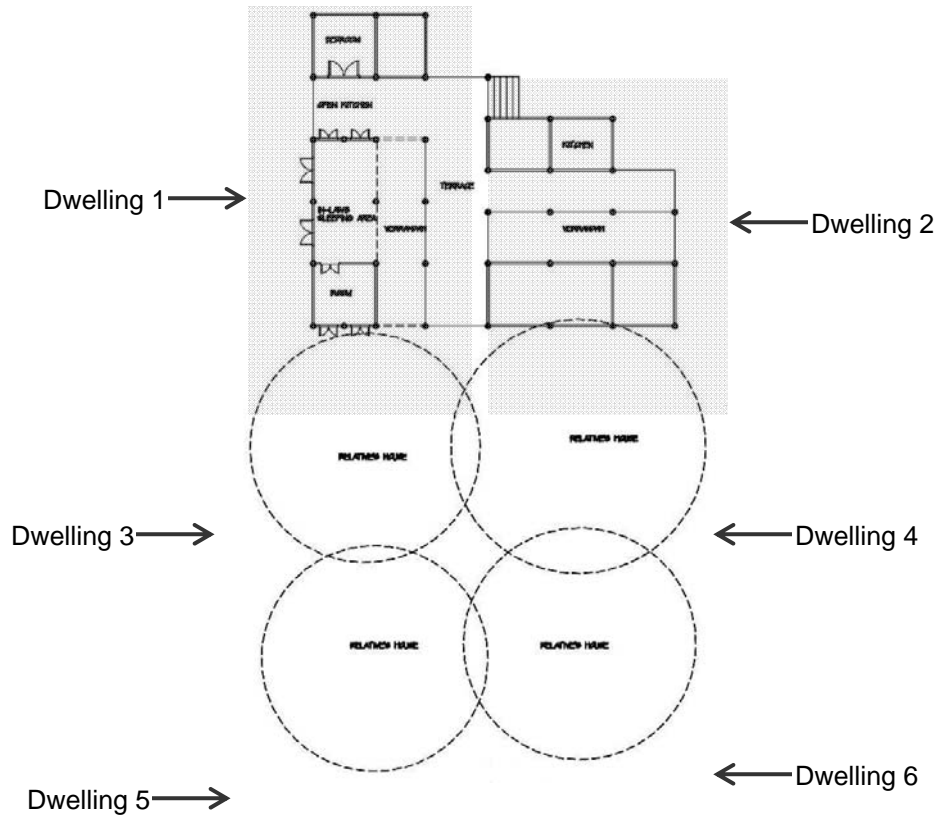


**Figure 95: Floor plan layout of contemporary home (H03)**

In today's environment where the family structure of the farming family has been collapsing and the number of family member along with the house occupants have been decreasing, perhaps the connection between the house and family has also been weakening. There is no longer a need to objectify the spatial symbols that spatial hierarchy once embodied in the rituals of a large family group.

### ***“Collective” versus “Individual” dwellings***

Prior to the implementation of ‘Land Consolidation’ program, in Suphanburi during the early 1980s, farming families in this area lived in a tight-knitted community. Some families lived in a compound of multiple dwellings that belonged to an extended stem family with a large number of siblings or relatives. The following floor plan layout shows the characteristic multiple dwellings within a family compound that can no longer be seen in the Baan Krang area.



**Figure 96: Example of multiple dwellings compound (H07)**

The above drawing was constructed based on the interview account combined with the actual floor plan of the existing dwelling. There were two units of dwelling in the main adjacent platform; one belonged to the respondent, and another belonged to her close relatives. The bubbles in the drawing represented other dwelling units, also belonged to relatives, connecting to the house of the interview respondent. Some of the interview participants indicated that the cluster might be made up of three to seven connecting dwellings, with individual access from the ground level. In some certain cases where houses were not connected to each other, the residents would use large and thick wood plank as a bridge between each dwellings to create easy access to each other without having to get down to the ground. This is quite characteristic of fisherman's homes in the Southern part of Thailand shown in the picture below.



**Figure 97: Compound of connecting dwelling in fisherman village from Southern Thailand**  
[Source:travelwebshot.com]

The compound of multiple dwellings, of historic homes, demonstrates a strong collective oriented social unit. Ties among community members and relatives were very strong. The residents of these multiple dwelling compounds also benefited from a reduced risk of robbery and intrusion by strangers. Working age parents were free to leave for work without having to worry about children or elderly family members because they could share a care taker with other relatives living in the same compound.

Contemporary settlement of the farmers in Baan Krang not only has changed from the river cluster to the homestead type, but the dwelling compounds have changed from a cluster of multiple homes into a stand alone dwelling.

Changes in agricultural technology and in labor mobility might be major influencing factors for this shift. Soon after the introduction of intensive rice production during the 1980s, farming required less manual labor, and became more profitable. Younger families are no longer obliged to share a small piece of land near the river with other kin. Increased income enables farmers to expand farm holdings, and relocate closer to the newly acquired paddy land. The setting of collective oriented dwellings is a rare

sight since it has incrementally changed into a more stand alone house in a newly established homestead.

### ***“Outward” versus “Inward” focus***

The impact of social changes on settlement characteristics and community relations has ramifications for the dwelling form of modified homes. A strong separation between the interior and exterior space of the dwelling is increasingly noticeable in today's home.

Historic homes that were more open, both at the roof and the enclosure plane. No clear cut boundaries between outdoor-indoor spaces of the dwelling were presented in the older homes. The roof of the house only covers the living compartment while leaving the rest of the terrace platform open to all elements. The surrounding environment was still visible and could be directly experience by the occupants while staying on the upper platform.

Both the interview accounts and mural painting study suggests that the upper platform, in the Central Thai farmer home, was usually left unfenced as the issue of 'privacy' was not regarded as a major concern. If there was any, the fence would be a see through kind. Connection among family and community members was preferred over individual privacy. It could be clearly seen from the paintings this characteristic help facilitate the interaction between the residents, their kin, and other community members in the surrounding environment.

The interior-exterior separation of space in the modified home might have been caused by the disappearance of communal space around the houses. Evidence from the temple murals and a study of the farmer community in Ayutthaya province indicates the importance of shared space and facilities among residents of the houses in the same compound. The houses were part of the rice production unit. The shared spaces between the houses were used for hulling the rice, an activity, which required participation from relatives and many other community members. Other facilities shared by families of relatives living in the same compound included a pond, and water buffalo barn. The communal space and shared facilities have gradually disappeared when animal and community labor was replaced by machinery.



**Figure 98: The main platform was not usually enclosed by the wall allowing the connection between the indoor and outdoor activities**

The spatial experience with the modified home is quite different from that of the historic one. These solid enclosures that extend across both the vertical (wall) and horizontal (roof) dimensions of the house have severed visual continuity between the interior and exterior of the dwelling. The house has become rather like a close protective envelope than a dwelling with free flowing open space where insiders and outsiders can easily interact.

The central of focus of farmers' domestic lives has shifted from the communal area between the houses to the single-family activities that occur in interior of the house. The outdoor-indoor separation of a modified farmer's home is apparent. In some well-to-do families, a space or see through fence surrounding the raised platform were replaced with solid wall panels. The roof top has also been extended to cover the whole platform. The shared living quarters have been turned into individual rooms while the terrace has become a large hall under a large expanded roof. The contemporary home is becoming larger even while family size is reduced.



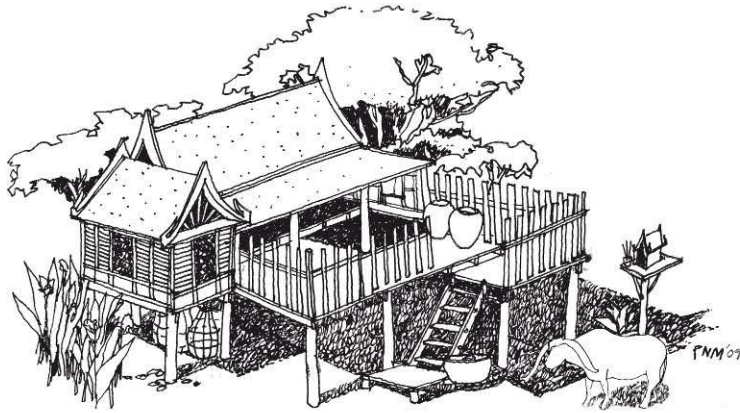
**Figure 99: Some of see through wall that still remains in the contemporary home**



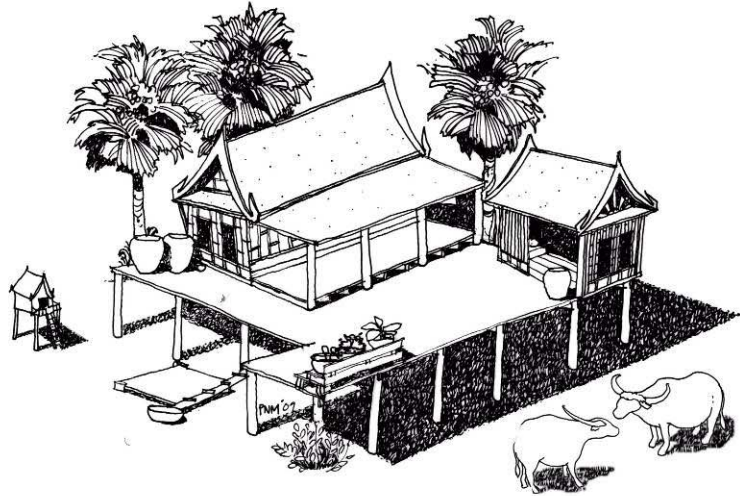
**Figure 100: The foldable wall surrounding the terrace is now permanently closed**

The shift of focus in domestic life from collective to individual focus could also be further explicated by the changing life style of the farmers. Equipped with the modern amenities, the interior of the house has been increasingly used by the modern farming family to do activities such as relaxing and watching TV. These modern amenities have also been a point of concern for robbery for the farmers when they have to leave home for work. With the settlement spread out, each family can no longer benefit from having a community watch. As such, the residents are compelled to increase their home security by creating an envelope that shields the property within their home from any undesirable incident.

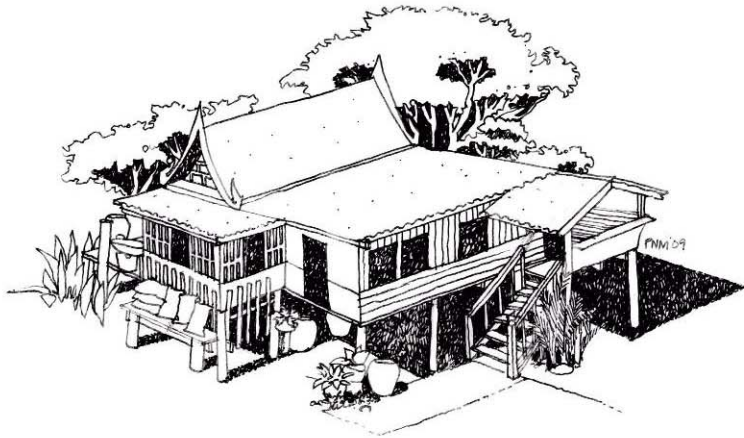
For the purpose of discussion and comparison, the isometric sketches of historic version of two houses (H03 and H04) are made to compare with the sketch of its contemporary counterpart. It should be noted that the sketches of the historic version of the houses are not to be taken as an accurate depiction, but a reconstruction of an idea of a house driven by the data gather through the study.



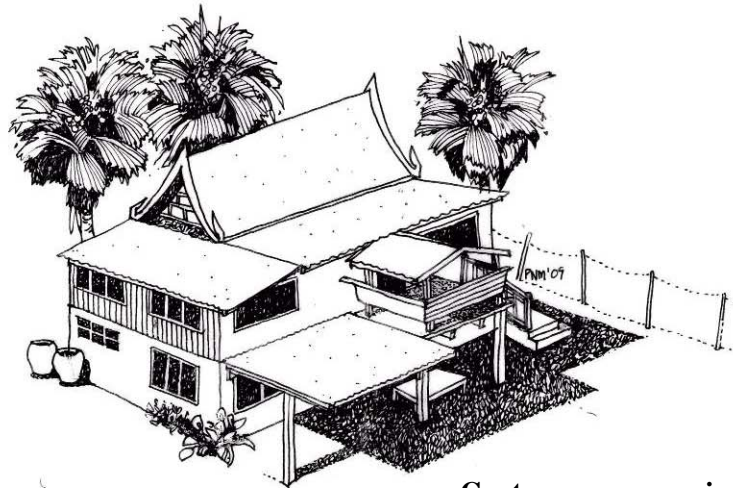
Historic version of H03



Historic version of H04



Contemporary version of H03



Contemporary version of H04

Figure 101: Comparison of the historic (reconstruction) and contemporary houses.



**Summary**

Common characteristics of historic homes of farmers in Central Thailand, Baan Krang community, could be described as having (1) hierarchal Spaces, (2) dynamic flexible construction, (3) outward focus, and (4) collective oriented.

Historically, the structure of farmers’ dwelling was quite flexible. The house could be easily reconfigured to accommodate varying family sizes or relocation as required. The significance of ‘seniority,’ as an influencing factor within the Thai family structure, was reflected in the form of vertical hierarchy of space within the dwelling. Kinship relations and community activities, indispensable supports to the historical rice farming community, were also presented in the construction of housing compounds that were made up of multiple dwellings as well as house designs that facilitated easy interaction between the residents in the dwelling and other community members in the communal spaces nearby.

**Table 27: Comparison between characteristics of historic and modified homes**

	<b>Historical</b>	<b>Contemporary</b>
<b>Interior space</b>	<ul style="list-style-type: none"> <li>● Hierarchal spaces</li> </ul>	<ul style="list-style-type: none"> <li>● Integrated space</li> </ul>
<b>Dwelling structure&amp; Enclosure</b>	<ul style="list-style-type: none"> <li>● Dynamic flexible construction</li> </ul>	<ul style="list-style-type: none"> <li>● Static and permanent construction</li> </ul>
	<ul style="list-style-type: none"> <li>● Outward focus</li> </ul>	<ul style="list-style-type: none"> <li>● Inward focus</li> </ul>
<b>Community Level</b>	<ul style="list-style-type: none"> <li>● Collective oriented</li> </ul>	<ul style="list-style-type: none"> <li>● Individual oriented</li> </ul>

The shared characteristics of the contemporary farmer houses are (1) integrated space, (2) static and permanent construction (3) inward focus, and (4) individual oriented. Structure of the contemporary dwelling has become less adaptable as increasing use of permanent, heavy weight, and rigid materials were observable in the modification of the houses. The spatial quality of the house has become more integrated in both the horizontal and vertical dimension. Vertical hierarchy of space along with cosmological symbolisms that represent labor division, gender roles, and the importance of seniority have been diminishing in the contemporary home.



**Figure 102: Contemporary homes have been modified to become more of a bungalow style house**

Space in the farmer's houses has become more egalitarian. Multiple dwelling compounds have been replaced with the construction of individual dwellings throughout the community, as family members were neither compelled to live near the river nor dependent on a system of labor exchange anymore. Consequently, without the relatives or neighboring homes nearby, the residents feel the need to increase their sense of home security by creating an enclosure that easily controls access to the house. Thus, the contemporary houses of the farmers are different from that of the historical ones in the aspect of dwelling structure, spatial and settlement characteristics.

## **Chapter Eleven:**

### **Social change and the Thai house**

This chapter integrates and summarizes results from the mixed methods research model presented in preceding chapters. It also addresses findings in relation to the research purposes and questions while underscoring the dialectical relationship between social factors and the transformation of vernacular architecture.

The study of “social change and the Thai house” is guided by a combination of scholarly and applied research goals. The documentation and analysis of the dynamic between the physical characteristics of the vernacular architecture serves to provide invaluable information, for architectural research, on the role of vernacular architecture in relation to changing life style in a social context. For applied research suggestions for design implementation are offered for both housing design in rural areas of Central Thailand as well as the use of an evolving dynamic model of vernacular architecture as a tool for design education.

The multiple methods used in this study make possible an understanding of the built environment as an integral part of the dynamic and lived world. The combined research design of this study takes its primary elements from the investigation of house form (plan, aesthetic quality, materials, methods, and orientation to the landscape), settlement patterns (spatial distribution of rural and urban houses), and the ways in which space is used (formally and informally, in public and in private). These elements are discussed as they interact with family and social organization, and with changes in social, political, and economic relations.

The interpretation of findings uses a structuralist interpretive framework which theorizes that individual phenomena have meaning by virtue of their relation to other

phenomena as elements within a systematic structure. It takes a holistic approach that searches for constraining patterns, or structures centered on human culture.

### ***Implications for scholarly research: Vernacular architecture and changing experience of place in a socio-cultural context***

The morphology of the Central Thai house along with its usage has been shaped by technological, social and economics forces. Following World War II, the demographic transition from subsistence farming to rapid urbanization has been the key agent of change in Thai society. Starting in the early 1960's aid from international organizations and progressive government programs facilitated massive urban growth and infrastructure expansion throughout Thailand. One of the high impact government policies aimed at improving the agricultural sector was the "Land Consolidation" program of 1974. Several large networks of irrigation canals, paved roads, and paddy land leveling, including other land and water resource developments in the Central Plain have resulted from this program.

In regions where rice farming has become increasingly productive, such as that of Baan Krang, the livelihood and quality of life of farmers has substantially improved. Farmers have been able to acquire larger farm holdings to increase crop output, and thereby increase their income. With improved access to water for rice growing and everyday use, farming families began to move away from overcrowded riverside settlements to establish homesteads on newly developed farmland. The new farming settlements have spread further apart trading the security of being amongst a tight-knit community of kin for a more isolated environment.

By the 1980s, when the frontier of arable land had been fully utilized, the introduction of non-seasonal rice varieties, agricultural machinery and intensive rice production practices were employed to their fullest capacity to maximize crop yields. With these changes, the younger generations of farm laborers have become free to migrate to urban areas to seek better jobs has resulted in smaller family sizes and has altered the demographic makeup of the rural village. A picture of the Thai rural village that is made up of several clusters of large extended stem families has been replaced with small nuclear families scattered throughout the area. Most elderly family members still

remain in their rural villages either alone or under the care of relatives, while receiving financial support from offspring living in urban areas. With these changes, the role of senior family members has been converted from the giver, of property and financial support, to being on the receiving end.

Despite all of the changes, several of the belief systems of the Baan Krang farmers remain intact. The practice of both Buddhism and Spirit Religion are commonplace in the community. Signs of their practice are easily found in the almost every household. However, neither of the belief systems has been found to provide guiding principles for housing design or for the conduct of domestic life like those found in other regions of Thailand.

Matrilocal residence rule, where the groom moves into the brides family is still practiced, but not as a means to turn the community into a matriarchal one. Gender equality in the family is another distinctive feature of the population in Baan Krang. Both genders recognize the importance of their complementary roles in working, socializing, and maintaining the family. The recognition of these complementary roles has been objectified in the Spirit Religion symbolism found around the households.

With that said, this study reveals how the domestic experience and the physical attributes of the house in Baan Krang have been transformed by socio-cultural change. The traditional house, of the traditional Central region design, with its delicate form and delightful architectural features has not withstood socio-cultural change. It has been modified to fit the needs of its occupants as the social environment evolves. Canter's (1979) 'Place Model' can be used to summarize the impact of these social changes on the domestic lives and house forms of the Baan Krang community.

The once open airy design of the traditional house has in the modified home become enclosed and sealed off from the elements. Construction of roofs and walls enclose the now scarce and valuable hardwood of the terraces for protection from weathering. When compared to the historic home, the ratio of exterior to interior of the modified house, on the living platform, has drastically decreased from 3:2 to 0:1. The distinctive features of hierarchical arrangement of flooring levels, which metaphorically reflects the fundamental cosmos of the residence, in the historic house has also been replaced by designs with a single roof plane and a single floor plane. The sacred, the

profane areas, and their transition have been united and combined into one large multipurpose hall under an extended roof.

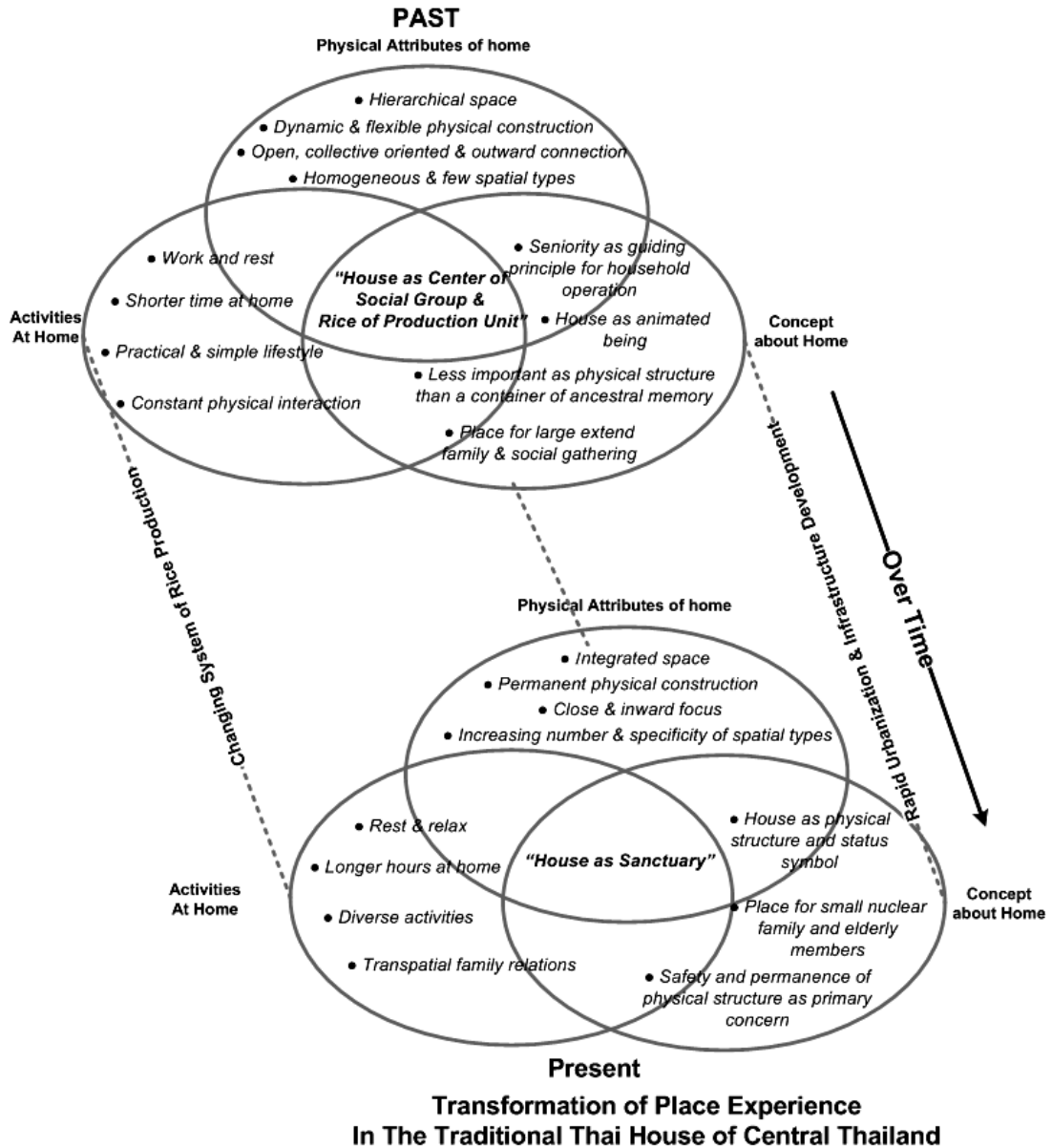
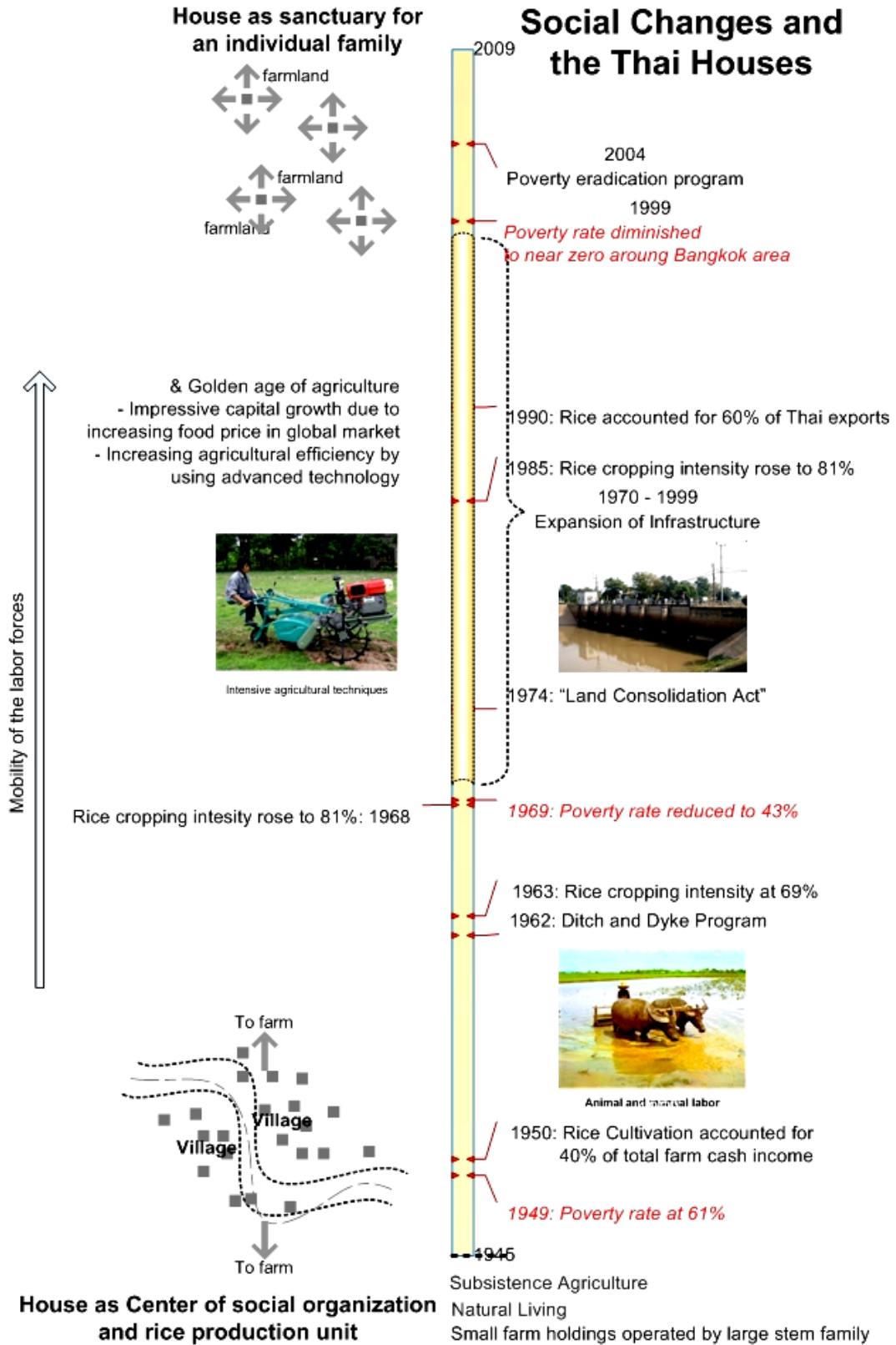


Figure 103: Transformation of "Place Experience" in the traditional Thai house



**Figure 104: Time line showing the social factors influencing transformation of traditional Thai house design in Baan Krang area.**

With these changes, the representation of seniority, and hierarchical differences required for maintaining structure in a larger family unit has been more or less obliterated from today's farmer's home although the role of senior members of the family has not been much altered. The finding of integration of the horizontal plane in the modified home is further supported by the spatial analysis of the house floor plans which show an increase in the average spatial 'Integration' value in the modified home. However, both theoretical and literal replication studies, with larger numbers of dwellings are required to confirm this finding.

The increased integration in the modified home also resulted in reduced sequential arrangement of interior spaces. Justified graphs of modified houses also show the differences between the highly lineal spatial sequencing in the historic home when compared to the modified homes.

Some commonalties and differences in the spatial qualities among the historic and modified homes are generally present throughout the samples. Both types of houses are similar in terms of landscape orientation toward the main transportation route, and the same arrangement of houses in the one community, which explicate the collective oriented attitude of the community members. The results from spatial analysis also indicate a similar exterior-to-interior relationship for both historic houses and modified houses. The interior spaces are well integrated and syntactically segregated from their surroundings. The single entry design has been used as a means to control access to the dwelling in both the historic and modified home, but the desire to separate the interior of the house from its surrounding environment seems to be stronger in the modified home. This may be a consequence of increased concern for household security along with increasingly isolated homestead type settlements. This is a plausible explanation for why several architectural features of historic homes, such as see-through fences, balustrades, and foldable terrace doors have been replaced with fixed and solid walls.

The changing lifestyles of today's farmers coupled with the availability of modern amenities and conveniences have resulted in changes to the interior space of the modified home such as specificity in the spatial types and number of spaces, and use of walls and other barriers as social insulation between spatial types. Some spatial types, such as a washroom are added to provide comfort to the residents; while other types, such as an



open kitchen or storage area, emerge as a consequence of modern necessity or unintended deviation from a traditional design. When compared to a historic home with a relatively homogenous spatial type where most spaces except the kitchen are empty of furniture and can be converted to fit diverse uses, the spatial categories of the modified home have become more specific, and less conducive to alteration due to the conscious utilization of new furnishings as obstructions.

In short, the dissimilarities between the historic home and the modified home may be greater when perceived at the level of the phenotype or overall appearance. However, when considering the genotype or the spatial organization, several spatial features in the historic home have persisted into the modified home. The pattern of space in both home types still encourages family activities although the need for visual privacy seems to be increasing in the modified home as the occupants spend longer hours together.

The Thai farmers perceive the house as an organic whole. House construction is viewed as an ongoing process that is never completed. Most farmers, with sufficient funds, will continue to engage in piecemeal home improvement projects without the aid of a professional designer. The need for modification entails both the desire for presenting symbolic status, and the need to create a highly stable and permanent living environment. The primary purpose of the renovation and improvement is the 'permanence' of the ancestral home (permanence of descendant line) rather than the expression of style or aesthetic concerns. It is safe to say that, physically and spiritually, the Thai house has remained a container of ancestral memory in which parts of the structure can be shared among the descendants as a means to carry on and preserve the collective consciousness.

Some distinctions between the meanings of 'historic' and 'modified' house can be made. Historically, the house is seen as a center of social organization for a production-oriented group organized around agriculture. The house is also seen as an 'animate' and delicate being and associated with the nurturing female spirit, where in the 'modified house,' the dwelling is perceived as sanctuary, refuge, a place for relaxation, but increasingly so as a physical structure where security and display of status are of primary concern. The modified dwelling now houses a much smaller number of occupants, but has a significantly larger area and more elaborated spatial types than the historic home.

As a researcher, I have learned a great deal about the ongoing dialectical relationship between human actions and the built setting as outcomes of social practices from decoding the vernacular architecture. From observing the transformation of vernacular architecture, I have also learned about the meanings that constitute the form of the built environment, and how it is continually modified as the actions that constitute that environment have changed. The vernacular house is not simply a representation of a static local culture, but is a product of an ever-changing relationship between peoples' lives and ideas.

As a designer, I suggest that the pairing of meanings associated with the evolving design features, emerging from the vernacular Thai house in this study, can contribute toward recommendations for contemporary housing design in Thai culture, which will be presented in the following section.

### ***Implications for applied research: Suggestions for design practice and education***

With respect to practice, transformation of the vernacular farmhouse in Central Thailand can be best described as an ongoing evolutionary process. We can learn from the traditional features that have been retained in the modified dwellings, and learn from features that do not work well in the modified dwellings. They tell us what the occupants want, and how they try to adjust the environment to best suit their current needs.

In terms of basic health considerations, Thai people have a close relationship with water, and tend use copious amounts of water to clean the body or find relief from the heat. A washroom has thus become an important feature in the contemporary Thai house. However, the washroom tends to be constantly wet, poorly lit and inadequately ventilated. Improvement of safety and hygiene of washrooms will very likely improve as the modified home design continues to evolve.

Some detailed features such as a complete separation between the kitchen and the living area, along with use of ventilated wall and ceilings are strongly recommended to be used in all contemporary housing design in Thailand. Current design practice of integrating kitchen into the main living area, that is an adopted feature from western

design, presents strong limitations for cooking—similar to those in the modified homes in this study. Rapid air movement is still a top priority in the context of the Thai kitchen.

The findings in this study suggest an increasing need for visual privacy, or interior-to-interior insulation, when residents spend long hours together. Although privacy has not been a primary concern for the collectively oriented Thai in the past, today the desire for individual space with sufficient privacy seems to be required for self-reflection and the expression of personal freedom.

The use of flexible installations such as moveable diaphragm walls, or foldable panels, found in the historic homes, may be adapted for use in contemporary housing designs as the features are so amenable to adjustment. These may be used to provide temporary spatial division for additional family members or guests. Increases in the elderly population in the near future may make care for the elderly of particular concern. Flexible spatial division is well suited to the Thai lifestyle with its emphasis on sociability and extended families. This extends beyond the farmers of the Central region to all Thais in other regions be they rural or urban.

The historic home design features are, by and large, suitable for housing projects or hospitality facilities with a community oriented mindset since the design features are visually permissive to the exterior-to-interior interaction while the occupant stills remains in the dwelling. However, these design features may not be suitable in the urban environment with high crime rates since they are vulnerable to undesirable intrusion.

To promote community values and safety, new housing development projects in rural areas of Central Thailand may borrow the idea of the historic home settlement. The design of the community layout may be designed with special attention paid to create cohesion among community members. Similar to the common working (rice processing) area that used to exist in the middle of the historic home cluster, common facilities and semi-public space could be incorporated into the design of the project to connect the public and private space together. It could be used as a locus of interaction where social ties among community members are developed and a sense of community is fostered. In addition, this common area might contribute to reduction in the fear of crime and its occurrence. However, special care must be placed in assigning space to individuals and

small groups to use and control as their own private areas to isolate/remove the criminal from the turf. (Newman, 1996)

Adoption of western housing designs, which are suitable for the need to retain heat in a much colder climate, have led to massive and unnecessary energy consumption related to the costs of cooling in a tropical climate like that of Thailand. For the environmental friendly design, the architectural features that enable an optimal balance between natural air ventilation and sufficiency of natural light, such as the use of high ceilings, see-through lattice walls, and courtyard like floor plan layout, would be ideal for energy conservation. Locally produced and renewable materials such as terracotta tiles or shingles may be used in place of the imported ones as they are not only serve as a thermal shield, but are also ecologically friendly, although, they are vulnerable to decay and less durable than comparable synthetic materials.

The growing aging population seen as a global trend is also evident in the rural area of Central Thailand. The movement to re-examine the basic development patterns of both community and housing design to find a solution for community planning with increasingly large aging populations throughout the country. The question of how to accommodate an aging population who wishes to continue living in their community (aging in place), rather than moving to a specialized retirement community should be addressed and prepared for. For this to be possible, special attention and effort must be paid to research and development on the issues such as accessible land use patterns, mixed use of space, diverse transportation services for people with various needs and abilities, universal design for housing development that accommodate mobility aids and wheelchairs.

### **Implication for design education**

Apart from scholarly interests, learning from vernacular architecture also has implication for design education in Thailand. The investigation of the transformation of house form underlies the evolving process that continuously reshapes vernacular buildings. This process is a propelled by the external factors, socio-cultural forces, the specific needs of the inhabitant, as well as geographical limitation.

This study challenges the existing perception, of vernacular study in Thailand, that the form and detail of vernacular architecture is static. It contends that the studies of vernacular buildings are valuable both in terms of the aesthetic aspect and the design process.

A survey course that focuses on the transformational aspect of the vernacular houses form may be incorporated into the formal architectural education. The course could be structured in a way that students may directly learn from the real life examples—both the houses and the people, rather than from the secondary sources, to optimize direct experience and in-depth understanding of the vernacular architecture. With this approach, the students will become increasingly perceptive designers who are sensitive to the cultural, historical, or geographical needs of the people that they serve.

### ***Limitations of this study***

As Carsten and Hugh-Jones (1995) note, “houses, like bodies, are complex, multifaceted entities, particular aspects of which are given meaning by different people, in particular cultures, contexts, and historical conditions.” These meanings constantly shift within cultures, and they have no inherent cross-cultural validity. However, the process by which the vernacular design has been generated and evolved, as informed by this study may be applicable to some degree in similar cultural and geographical contexts.

Resources and time constraints limited the sample size of houses in this study. However, the sample size was deemed sufficient given that the aim for this study was to generate a theoretical understanding rather than to generalize to the population.

A focused group approach would have been ideal to stimulate the interview while helping to cross check the accuracy of the data. However, it proved difficult to organize a focus group interview among primary interview respondents, as most of them are elderly and are often unwilling to leave home. The task of stimulating and validating the accuracy of the interview account was left to other family members who were also present at the interview.

This study is also limited by the fact that the data derived from interview accounts are self reported. The family members describe their attitude, and domestic lives, as

elicited by the interviewer. Consequently, attitude and behavior reported may differ and not correspond to real life.

The raw material used for Space Syntax analysis is based on the data collected through the field survey of the actual farmers' houses. The floor plan layouts of the existing (contemporary) houses have been measured, photographed, and videotaped by the researcher. Then the information from the initial measurement, sketch, and other forms of documentation were translated into the actual drawings. The credibility of the data used in constructing the floor plan layouts for the modified dwellings is enhanced through the use of a multiple cross-referencing of the relevant data. In addition, to ensure the accuracy and reliability of data collected the researcher has rechecked the drawings produced against the actual dwellings during subsequent visits.

The reconstruction of the 14 historic dwellings' layouts was based on the recollection of the informants. There may be error or bias in their memory since these houses are generally quite old. Many occupants had to trace back to memories from childhood, some of which went beyond 50 years. However, the researcher has used the drawings of the existing homes of the occupants to communicate, and use as a tool to construct the floor plan layout of the original home of the informants. In addition, the information from an existing (unoccupied) historic dwelling and two museum houses were used to corroborate data obtained from informants. In some families with more than one informant, the cross checking of information among interviewees proved useful for increasing the accuracy of data regarding their original home. Nevertheless, when compared with the existing home, the level of detail and accuracy of the data on the usage and categorical differentiation of interior spaces within the historic dwellings while less than ideal was considered of sufficient quality for use in investigating the study question.

### ***Implications for future research***

Findings from this study suggest several opportunities for additional research into social-cultural influences upon home design in Thailand. Both literal and theoretical replications of this study are required to increase the applicability of the results and the value of the study's design implementation.

Additional research may investigate why certain kinds of social change lead to changes in home design whereas others do not. For example, a comparative study of the Central Thai with other cultures such as those of Okinawa Japan where the house form and spatial organization has not changed although the materials used and Japanese culture in general have been more radically modernized since World War II.

Findings from this study might also influence research into the evolution of contemporary housing and apartments. For instance, how is contemporary housing design influenced by variations in lifestyle including the residual effects of the original Thai lifestyle? How do commonalities and differences between rural and city dwellers influence contemporary house design?

Additionally, this research suggests that study of the folklore and collective consciousness such as urban legends may influence perceptions of the house. Does the increasing tendency to enclose the structure of the modified house result solely from security concerns or is there a deeper cultural meaning? Finally, what recommendations can be made to create a house design that is more socially connected? Techniques used in this study, can be useful in investigating existing housing projects to gain a better understanding of the perceptions of their inhabitants, and to study the pattern of alteration to find out how they want to create their living environment. In effect, learn what works, and what does not.

## **Appendices**



***Appendix A:***  
***Semi-structure interview scripts***

## ***Interview with Occupants of the Traditional Thai House***

### ***Semi-Structure Interview Questions***

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#### **DEMOGRAPHIC INFO & GENERAL QUESTION ABOUT HOME**

- 1) How long have you lived in this house? \_\_\_\_ Years
- 2) And, do you know how old is this house? If yes, how old?
- 3) Do you know who built this house? If yes, how is/was the person related to you.
- 4) Was this house originally built on this property? If not, please tell me where it was located before.

#### **FAMILY RELATIONS**

- 5) How many people currently live in this house?
- 6) Can you describe how these people are related to each other?  
(Can you explain or draw a family tree?)
- 7) What are the occupations of the members in your family?
- 8) Who is the head of the household at the present time?
- 9) Who is the breadwinner of the family?
- 10) This question is about work assignments among the members in your family.
  - 10.1) Could you describe the kind of works that male and female family members have to do, both in the farm and in the house? (For example who takes care of the house chores and cooking or who takes care of the farm and animals?)
  - 10.2) Could you tell me the reason for the work assignment that you have just described?
- 11) Has the work assignments in this family been as you described in question #10, and Why? If you answer "No" in question #, how was it used to be then? And how did you feel about it then?

#### **GENDER & COSMOLOGY**

- 12) Did this house have a traditional house building ceremony when it was first built?  
If so, can you describe how it was done?
- 13) Could you describe the orientation of this house? (North-South, East-West, or else?)
- 14) Is there any specific reason for why it is built that way? If yes, please let me know.
- 15) Is there a "Sao-Ek" (the first house post to be erected, at appointed auspicious time and chosen location as specified by the astrologer)?
  - 15.1) If yes, could you show me where it is? Did you make any offering or special ceremony for this "Sao-Ek"? If yes, could you describe the detail?
- 16) Are there differing floor levels in your house. Can you explain why it has to be built in such a way?
- 17) Are there any areas in the house where certain member are prohibited to enter? If so, please describe the detail (who, why, which time?).

- 18)** Is there....in your house?;
- a) Family altar;
  - b) Buddha's shrine;
  - c) Spirit shrine.
- 18.1)** Could you tell me where it is/they are? And why it is/ they are placed in such area?
- 19)** If there is a "spirit" shrine in this house, do you think the spirits are male or female? Please explain why you think so.
- 20)** Are there shrines for the '*Lord of the Land*,' and '*Guardian Spirit of the Land*' on your home property?
- 20.1)** Could you tell me where it is/they are?
  - 20.2)** And why it is/ they are placed in such area?
  - 20.3)** Do you think the spirits are male or female? Please explain why you think so

### **PERCEPTION OF HOME**

- 21)** What are the criteria for parents to use in determining the inheritance of the house?
- 21.1)** Has it been change over time? And how do you feel about it?
- 22)** After getting married, did you have to move in to your spouse house? Please explain why
- 23)** If you/your spouse had to move in, did you/your spouse feel comfortable in the new house? Please explain.
- 24)** (Usually, there was only one or two room in the house) Please tell me about the arrangement of the areas in the house before and after you were married? Please explain why it was arranged that way.
- 25)** If there is any, where in the house do you like to spend most of your time? Can you explain why?
- 26)** Which area of this house do the members of your family usually spend most of their time?
- 27)** Do you think there are specific areas for each gender or for each family member? (For example, in the Northeastern part of Thailand, men will not enter the kitchen while women are not allowed to be in Buddha's room during the menstruation period. Is there anything like that in your family?) Please explain why you think so.

### **SOCIAL CHANGES**

- 28)** Has your house always looked like this? If you answer no, can you describe what you can remember about the house?
- 29)** If you can remember, can you describe how the house was like when it was first built?
- 29.1)** Please tell me about the floor plan layout of your house then
- 30)** What are major social changes that have impact on your life and your livelihood?
- 31)** Do/Does those changes have impact on your house and property? Please explain
- 31.1)** And how do you feel about it?
- 32)** If there is something you would change about the house, what would that be? And why?

## ***Interview with Master Builders of the Traditional Thai House*** ***Semi-Structure Interview Questions***

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### **DEMOGRAPHIC INFO & GENERAL QUESTION ABOUT WORK EXPERIENCE**

- 1) How many years have you been practicing as the builders of traditional Thai house?
- 2) How did you become involve in the traditional Thai house building practice?

### **HISTORICAL AND TEMPORARY ASPECTS OF THE BELIEFS SYSTEM INVOLVED IN THE DESIGN, CONSTRUCTION, AND UTILIZATION OF THE TRADITIONAL THAI HOUSE**

- 3) What are the main characteristics of the traditional Thai House form of the Central region? (Design)
- 4) What are the formal differences between the historical and contemporary design of the traditional Thai home?
- 5) If there is any, how have the allocation of the area and functions within the house changes over time? (Family Structure, Design, Social Changes)
- 6) If there is any, what are the belief systems that impose the house occupants on the utilization of area within the home? (For example, the women are not allowed into the Buddha's room in the NE home). (Gender, Cosmology)
- 7) How do experience changes in spatial organization, sizes, and form of the house over course of time—in relation to the life cycle of the family. (Family Structure, Design)
- 8) Why there are several floor levels on the living platform of the house? (Cosmology, Design)
- 9) What are the reasons behind the rules governing the orientation of the kitchen and main stairways of the house? (Cosmology, Design)
- 10) In the past, it was common to find cluster of connected houses in the Central region. What were the reasons for people to build connected house? (Social Changes, Design, Settlement Characteristics)
- 11) Why do those connected houses disappear from this area? (Social Changes, Design, Settlement Characteristics)
- 12) Please describe and compare contemporary and historical aspect of the ritual involved in the construction of the traditional Thai house? (Social Changes, Cosmology)
- 13) Historically, how did people build their house? Did they buy the prefabrication house or build their own. (Social Changes)
- 14) What is the significant of the ceremony for first auspicious pole of the house? (Cosmology)
- 15) Please compare and describe the contemporary and historical aspect of the community involvement when someone is building a new house. (Social Changes, Design)
- 16) How does the belief about spirits in the house affect the construction and the occupation of the traditional Thai house? (Cosmology, Design)

- 17)** Some spirits that are believed to reside in and around the house. What are the functions of these spirits? (Cosmology)
- 18)** Some spirits are male, and some are female. What is the meaning behind the different gender of these spirits? (Cosmology, Gender)
- 19)** Why some of the important features of the traditional Thai house such as terrace, verandah, and differing floor level have been disappeared from the old traditional house that has been renovated? (Social Changes, Design)
- 20)** Why the see through fence surrounded the living platform of the traditional house had been converted to the wall? (Social Changes, Design)
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***Appendix B:***  
***Content analysis of the interviews***

**Content analysis coding of the interview with the farmers and the master house builders**

<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Cluster of extended stem house</b>	
<b>Clustered settlement by the river</b>	My old home had several compartments. They were connected by the terrace.	1
	My old place was right by the river. Everyone lived by the river then.	3
	Siblings' houses were so close together. It could be connected through a ladder or wood plank.	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>House construction</b>	
<b>Construction and design of historic home</b>	Building and dismantling the house require expertise of the builders	1
	Community participation in house buildings only occurred during the groundbreaking and process of setting the main columns	2
	Dismantling the house did not take long...It can be done in only a few days	2
	House building was a piecemeal process. The men prepare the parts during the break from the wartime	2
	House construction and maintenance is an ongoing process.	2
	It took about one day to assemble the main structure of the house	1
	It took about one month for 7 carpenters to prepare the entire house	1
	It took approximately two months for 2-3 carpenter to prepare the parts of the house	1
	Now, the house has become too expensive to be included as part of the dowry.	1
	The balustrade was difficult to make with hand tools.	1
	The house was usually built to be a bridal home.	10
	The prefabrication house was purchase from the builder	2
	There is no labor exchange or community help in house construction anymore.	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>The traditional house form</b>	
<b>Physical structure and functions of the historic home</b>	Commoner's house did not have balustrade...one had to be the aristocrat to have those	1
	Hierarchical flooring was for the ease of seating where people can hang the legs down	3
	Higher floor was a place for people with seniority	6
	House with large span was not structurally strong	2

	Only the rich could have the Buddha's room	2
	Single compartment was a normal size for the house, but the rich could have built double compartment home	1
	Small house was easy to dismantle.	1
	The hall in the middle was for chatting.	1
	The open terrace floor could be used for drying the crop during the flood season	3
	There were three levels in the older homes...the terrace, the verandah, and the inner compartment level	2
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	Dynamic and flexible structure of the historic home	
<b>Unique physical characteristic of the historic home</b>	Different compartments of the house could be split and given to different offspring	3
	The old home was easy to put together because the parts came prefabricated	1
	The removable walls allow the easy readjustment of the rooms	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Many functions of the inner room, the verandah, and the terrace</b>	
<b>Spatial utilization</b>	As I remembered, people often slept in the verandah and the terrace area	2
	Babies were delivered in the room	7
	Elderly prefers to sleep outside the room	5
	I and aunty slept in front of the kitchen...over there	1
	Most of the boys sleeps anywhere they pleased...on the verandah, the terrace	1
	Room was used for keeping our possessions. We slept on the verandah and the terrace.	7
	Sometimes two or three adolescent girls sleeps in the same room.	1
	The room was used as a bridal suite when we got married.	4
	We slept outside because it was very warm inside the room	2
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	Kitchen as a dining area and place for food preparation	
<b>Spatial utilization</b>	All of us ate in the kitchen together	9
	The old kitchen was in a separate compartment and was made of bamboo wall. Now it's more convenient to cook inside.	2



<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Functions of the underground area</b>	
<b>Spatial Utilization</b>	For having a feast and receiving guests.	1
	Grown up children were raised in the underground area while the small ones were kept on the terrace.	2
	Underground is comfortable. It's not hot as in the room on the upper level.	5
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Factor contributing to the positive relations among the in-law</b>	
<b>Family Relation (historic)</b>	I talked to everyone during the courtship...father...mother. We talked about everything	1
	Long courtship allowed the prospect in-laws to learn of each other	4
	The marriage was arranged by the elders.	3
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Diverse and active roles of the elderly</b>	
	<b>Elderly as head of the family</b>	
<b>Family Relations (both historic &amp; contemporary)</b>	Elderly is a pillar of a family. They give good advise	2
	I initiate the project, and all of us help to accomplish it.	1
	If a person was not married, the parents would take care of his or her money	1
	The elderly decides whose off-springs will inherit the house.	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Other active roles of the elderly in the household</b>	
	Elderly does the cooking as well	2
	Elderly stayed at home during the day to take care of the house and do some weaving.	4
	Elderly took care of the children while the parents were out in the field.	6
	Sometimes the elderly would take care of our farm animals	1
	The in-laws took care of my wife and my babies	2

<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Hierarchical structure in the cultural values that were expressed in the Spirit Religion symbols.</b>	
<b>Relationship between cultural value and spirit religion symbol</b>	Abode for Spirit Guardian of the land can be call Grand father's abode. He helps protentc the land. too	2
	Association between property right and the Lord of the Land abode	4
	Buddha shrine must be placed higher than the ancestor shrine	1
	Lord of the Land's abode rest on a single column, Spirit Guarding of the land's abode rests on 4 or 6 columns	1
	Spirit Guardian of the Land is lower than Lord of the Land	7
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>House inheritance criteria</b>	
<b>Family relation and resident rules</b>	A daughter get the house, and son gets the money	2
	Depends on the wish of the parents	1
	House goes to the person who takes care of parents	9
	Older sister worked hard, she deserved the house	3
	One does not have to split the home If the parents had enough money to build a new one	2
	The farms were evenly distributed among the off-springs	1
	The house went to the youngest child of the family.	1
	The only son had to stay with the family	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>House as a container of the descendant line; The house is a center for everything in life</b>	
<b>The meaning, the activities, the experience of the historic home</b>	I have lived in this house since I was born.	1
	In the old time, people deliver baby at home.	7
	People died at home. The wake was performed at home	8
	The entire life cycle is completed in a house	2
	The marriage was performed at home.	1
	This is grand father and grand mother's home.	2

<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Preference for collective living</b>	
<b>Family relations, collectivism, (no) privacy issue</b>	All of my seven young children went to work in the field with us.	1
	Do not want to be alone, there's no one to help when you get sick	1
	Everyone helps with the house chores...children, elderly, men, and women alike.	6
	Everyone in the house helped raise the children	2
	Families stayed close together to be family is to be together	1
	I don't need to be alone. I don't have any secret.	4
	I like the whole family to be together...make decision and work together	1
	In the old time, people did not concern about trespassing. There's no fence around the house like they do it these days.	1
	Now we still eat together either at the kitchen or at the balcony in front of the house	1
	Old timer liked to have descendant around. Easy for visiting and sharing meal	1
	The in-laws took care of my wife when she delivered a baby	4
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Resident Rule</b>	
<b>Gender role and family relations (historic &amp; contemporary)</b>	It was common that the groom move into to the bride's family home	2
	We stayed with her parents for a few years before getting our own home.	2
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Wife and husband's complementary role</b>	<b>Sources</b>
<b>Gender role, family relations (historic &amp; contemporary)</b>	Both husband and wife take care of animals and working in the field together	8
	Husband assists a childbirth process both intimately, and for other type of preparation.	6
	Husband is the head of the family, but the woman keeps the money. He will ask for the money when he needs to buy anything.	8
	Husband took care of laborous work while a wife took care of house work and less strenuous task.	6
	More labor division in the past. Now both of them help doing the work together.	2
	My children's father are very good. When noone's home, he could cook for himself.	7
	Now they still help each other. When my son gets home, he cooks too.	2

	Now, the role of husband and wife is not much different	1
	When it comes to decision making, both of us (wife and husband) matter.	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Role of women</b>	
Gender role and family relations (historic & contemporary)	A wife must stay with a baby until she finished lactating	7
	Cooking is a virtue of a woman	2
	Good house wife must be good at saving the money	1
	There are more options for women nowadays.	1
	Unmarried female relative helps taking care of children and elderly.	1
	Women's chores were a lot more than men's, but not as strenuous.	3
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Adhere to practical life. Superstition is not important.</b>	
<b>Belief system, activities (historic &amp; contemporary)</b>	Our ancestor never made rule for specific place for male or female	6
	The living in Thai house is practical. There is no strict rule.	2
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Subsistence Farming</b>	
<b>Livelihood, domestic life, and community relations in the historical context</b>	Labor exchange was common, hiring was rare	2
	Rice farming in the past was Na-Dam not Na-Wan just as we do in the present time	1
	Rice growing was done once a year. The rest of time we lived on vegetable and fish...just enough to sustain life.	5
	We did not usually buy our food from the market	6
	Weaving done by elderly brought a little bit extra in-come	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>The farmer's life prior to the Land Consolidation Program</b>	
<b>Livelihood, domestic life, and community relations</b>	Before, the outhouse was behind our home. It was difficult to use at night.	2
	Difficulties in transportation water management and rice farming prior to the Land Consolidation Program	1
	During the farming season, both of my parents had to camp out at the farmland for three months	1
	I had to get up at 4 am during the farming season	3
	If the house was close to the river, you took a bath at the river side, if not you use the water from	1

	the man-made well	
	It took almost half a day to walk to the paddy field	1
	The entire time was spent working in the field.	2
	We ate together once a day in the evening	10
	We took a bath at the river or the man made pond	1
	We went to sleep right after the sun set.	3
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Benefit of Land Consolidation Programs 1974</b>	
<b>The impact of social changes on the lifestyle and livelihood of the farmers</b>	Now we can come home to have lunch	2
	Road makes it easier for us to go to town or to get extra off-farm jobs.	6
	Road provide easy access to amenities and other facilities such as plumbing and electricity	4
	The new road was constructed after the Land Consolidation program	1
	The termite was gone after the Land Consolidation program	1
	We have more land to expand our house.	4
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Perception of a historic home</b>	
<b>Perception toward historic design homes</b>	Disliking of nooks and crannies in the house	2
	Older home was more vulnerable to robbery.	1
	Older homes were not well enclosed, but we used a removable ladder.	1
	The older home was more open. No fence...no balustrade...nothing It was all right then...	1
	We did not buy or collect a lot of things	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Reason for relocation</b>	
<b>Transformation of the settlement</b>	Too crowded and no room for expansion	2
	When the new road was built, we decided to move from the old place to get better access.	2
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Preference for home modification</b>	
<b>Transformation of house design and structure</b>	Changing from the vetiver roof to new shingle roof	2
	I like a single level flooring	8
	Tin roof is a luxury. The grass roof was cheap.	2
	Want the house to be higher so that we will not be troubled by the flood.	1
	Would like a large ground area so that we have enough space for the banquet..	1

<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Reason for home modification</b>	
<b>Transformation of house design and structure</b>	<b>Availability of materials</b>	
	Vetiver roof was not as warm as tin, but it's hard to find these days.	1
	<b>Ease of utilization and maintenance efficiency</b>	
	One level flooring is easy for elderly and little children to walk around	10
	One level flooring is easy to keep clean.	1
	Tin roof lasts over 10 years and does not have to be replaced as often as the grass one	1
	One level flooring uses less wood in the construction.	2
	Elimination of termite problem	1
	The exposure to the rain and sun corroded the wood.	3
	Wood is becoming more expensive	3
	<b>Other reasons</b>	
	To have larger domestic space for different ceremonial and banquet uses	4
	To prevent robbery and stranger to enter the house too easily	1
	To strengthen the existing house structure	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Mechanized rice production and family life</b>	
<b>Impact of social &amp; technological changes on livelihood and lifestyle of the farmers</b>	Everything is money	3
	Higher expense comes with developments	3
	Now it's convenient. We hire farm labors.	2
	Now they can get up at six o'clock and still have enough time to go to the rice field	1
	Off-farm income was common.	4
	Pesticide and fertilizer cost a lot money.	3
	Rice is grown 2-3 times annually now.	4
We do not keep the water buffaloes anymore since we now use the ploughing machine	4	

<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Contemporary Domestic Life</b>	
<b>Perception of contemporary dwellings and domestic life</b>	Contemporary home is convenient the older one.	1
	I like to spend time on the ground floor. I like it airy. (CH)	3
	In the new house, I sit in front to watch over it.	1
	Individual family has a lot smaller number of family members now.	1
	New home has small rooms and the indoor bathroom.	1
	Now people make the kitchen a part of the main house	1
	Now we still eat together either at the kitchen or at the balcony in front of the house	1
	Still prefer for traditional house form.	1
	The cluster of extended stem family houses is no longer existed. Each property is now fenced in.	1
	The new house is more enclosed	1
	The new house style has single level flooring	1
	We can use telephone to contact our children in Bangkok..if we want to	1
We have more possessions now...more robberies too.	1	
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Distrust of Strangers and fear of robbery</b>	
<b>Fear of the outsiders</b>	Now is not like the past. We cannot trust anyone	3
	Roads allow easy access. Some of the elderly was conned by the charlatans	1
	There are a quite a bit of robberies these days	3
	There was not so much robberies in the old time...only the buffaloes napping	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Expressed contentment with current condition of home.</b>	
Perception toward Home	Don't need to do anything with my house. It is nice, and nothing is broken.	2
	I love my house...the entire house. There's no favorite corner	4

<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>House is perceived as a living being and a ancestral home</b>	
<b>Family relation, spirit religion, and perception of the home</b>	Ancestral spirits return to protect their descendant	1
	Spirit abode signifies that the land is not ours.	1
	Spirit Guardian of the house (Phi-Mo) is a female spirit.	8
	Spirit Guardian of the house is actually the ancestral spirits.	1
	Spirit Guardian of the house loves the daughter in-law	3
	The ashes of ancestor are kept at home because they had made the wish to be returned to their home.	3
	We live in her (spirit) house. We must be nice and take good care of her.	1
<b>Theme</b>	<b>Coding</b>	<b>Sources</b>
	<b>Nostalgic feeling for closer community and family ties</b>	
<b>Impact of social &amp; technological changes on livelihood and lifestyle of the farmers</b>	In the old time, people did not concern for property rights.	1
	In the past siblings share mother's milk. Nowadays people drink cow's milk. They don't really care for each other.	1
	Now people prefer to keep to their own family. Siblings do not want to impose on each other.	1
	Now the large family get together is around Songkran or New Year time.	1
	Now, each family to its own. There's no connecting terrace anymore.	1
	When I was young, the house was the center for everything.	1
	When we first moved away from the river people still coming to my house to listen to the radio	1



***Appendix C:***

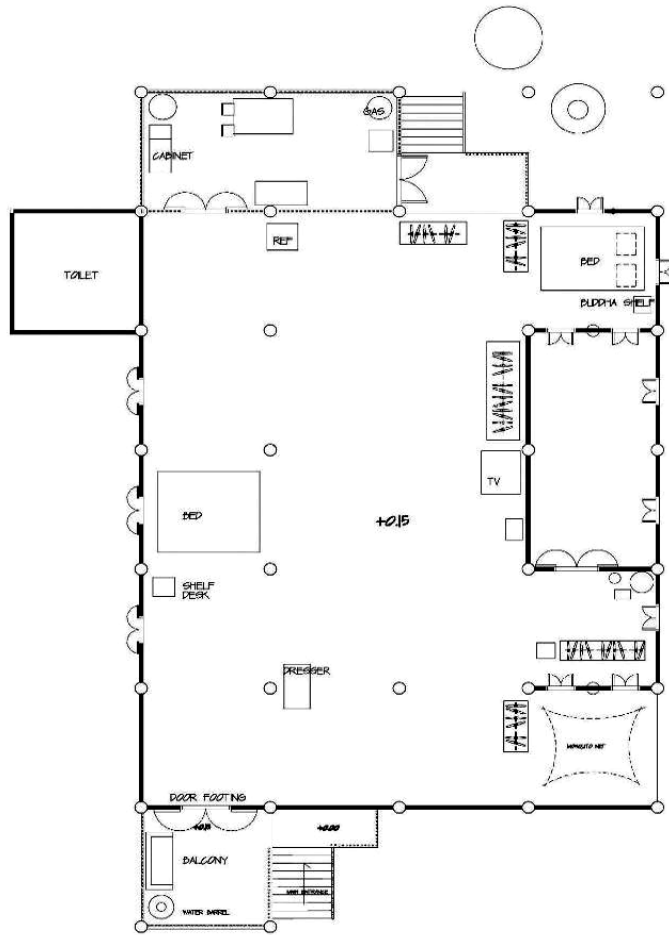
***Comparison between the historic and contemporary house***



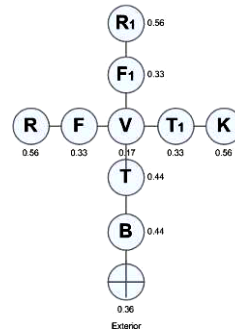
**House 01**



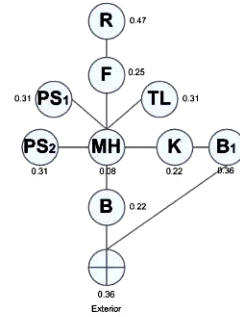
**House 02**



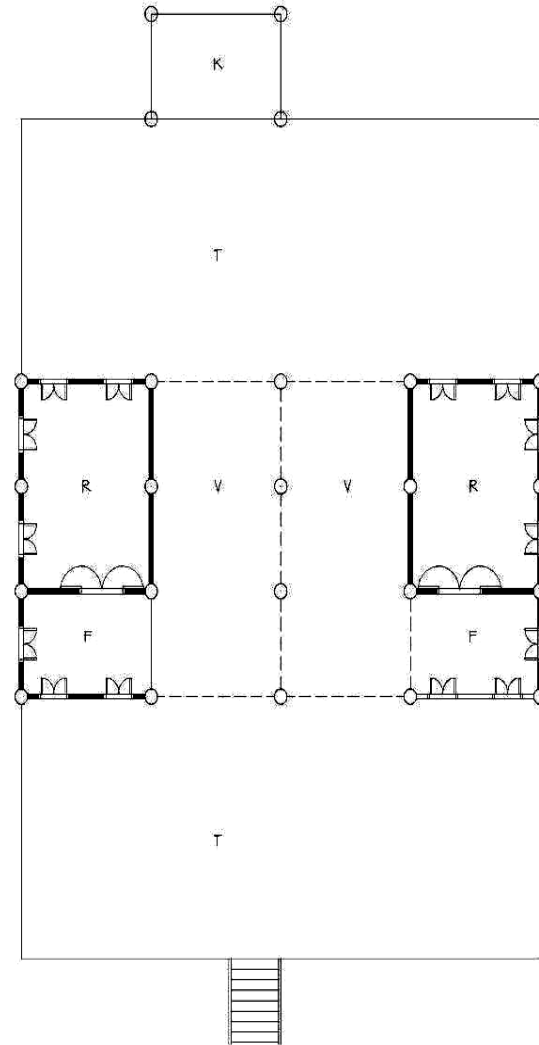
Contemporary



House 01: Historical (RA)

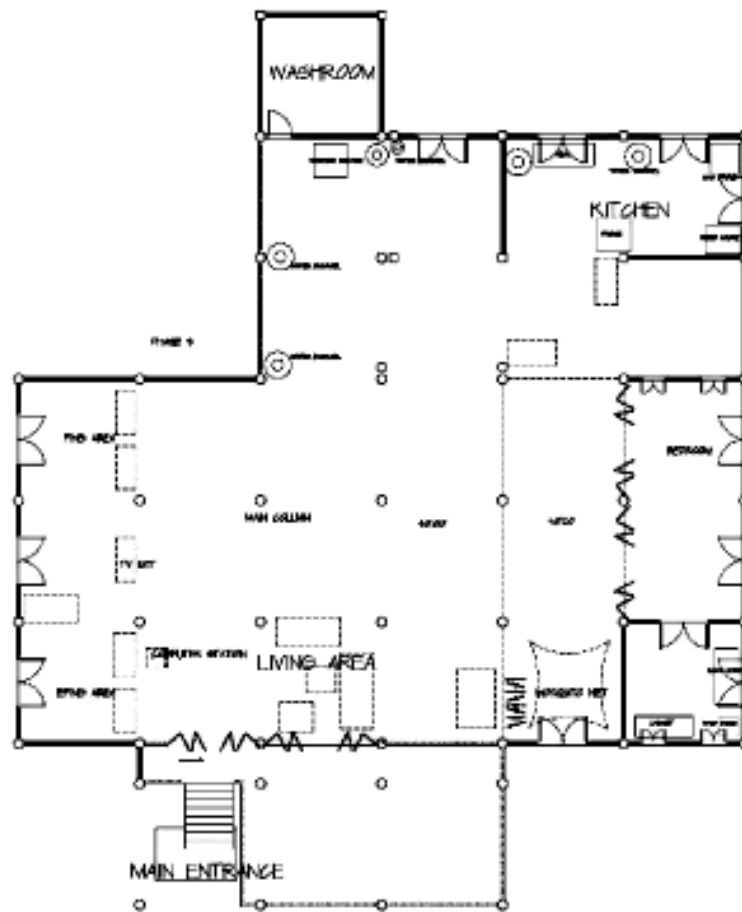


House 01: Contemporary (RA)

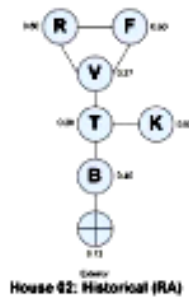


Historical reconstruction

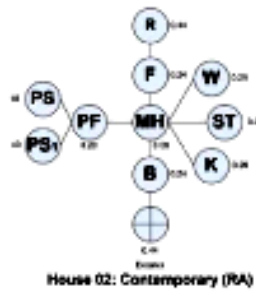
House 01: Floor plan layout & Justified Graphs



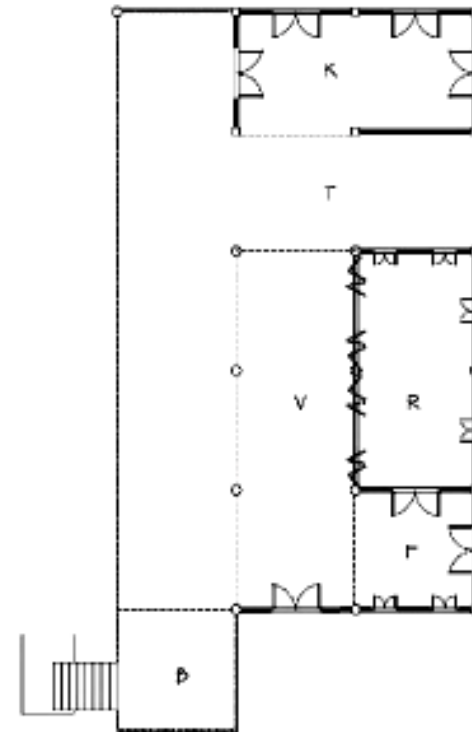
Contemporary



House 02: Historical (RA)



House 02: Contemporary (RA)



Historical reconstruction

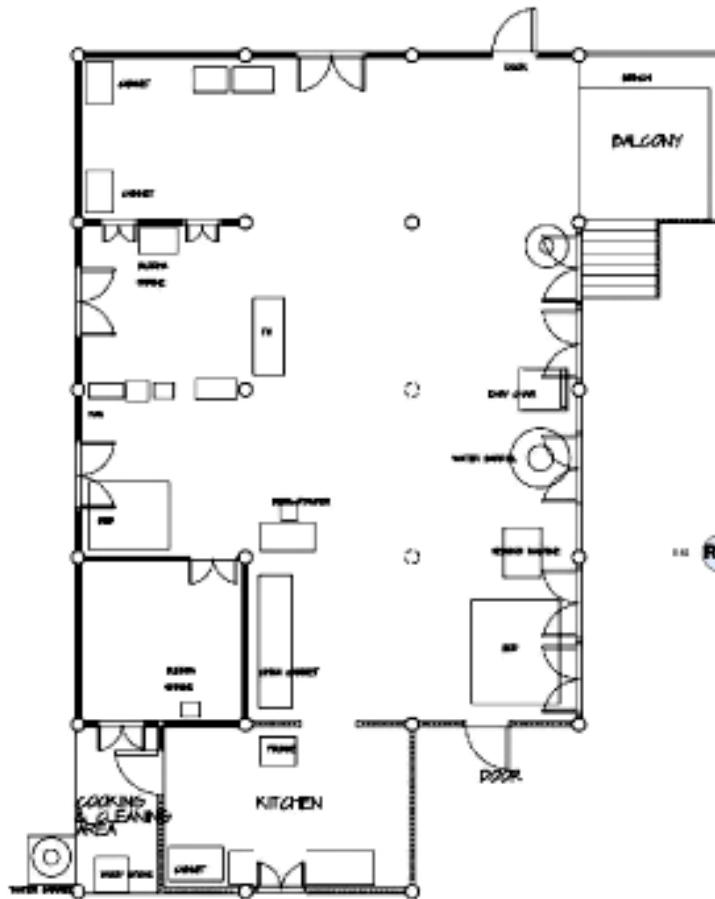
House 02: Floor plan layout & Justified Graphs



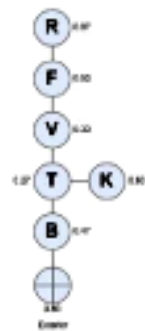
**House 03**



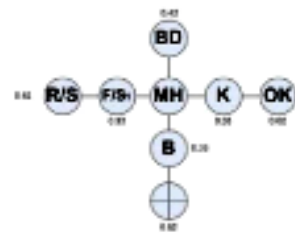
**House 04**



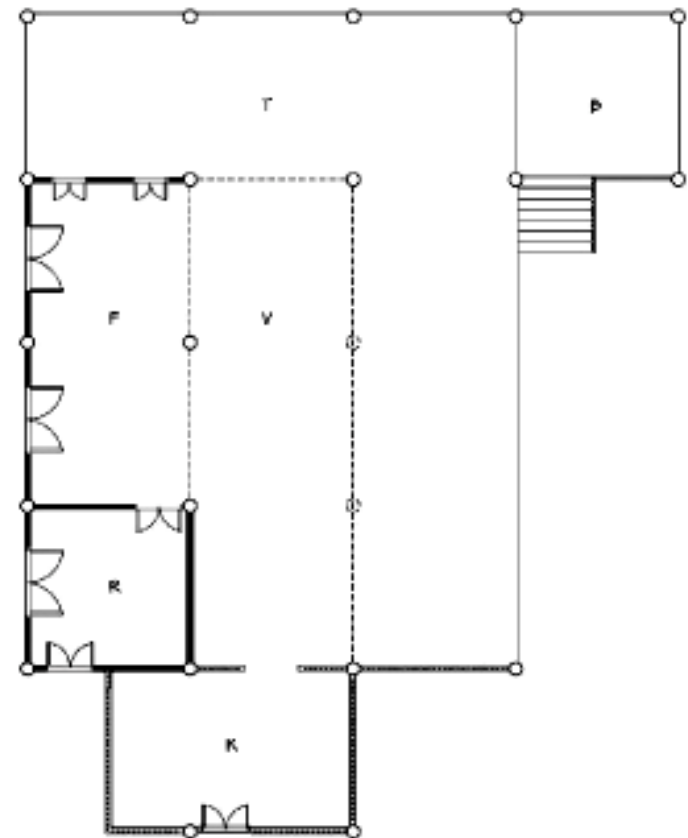
Contemporary



House 03: Historical (RA)

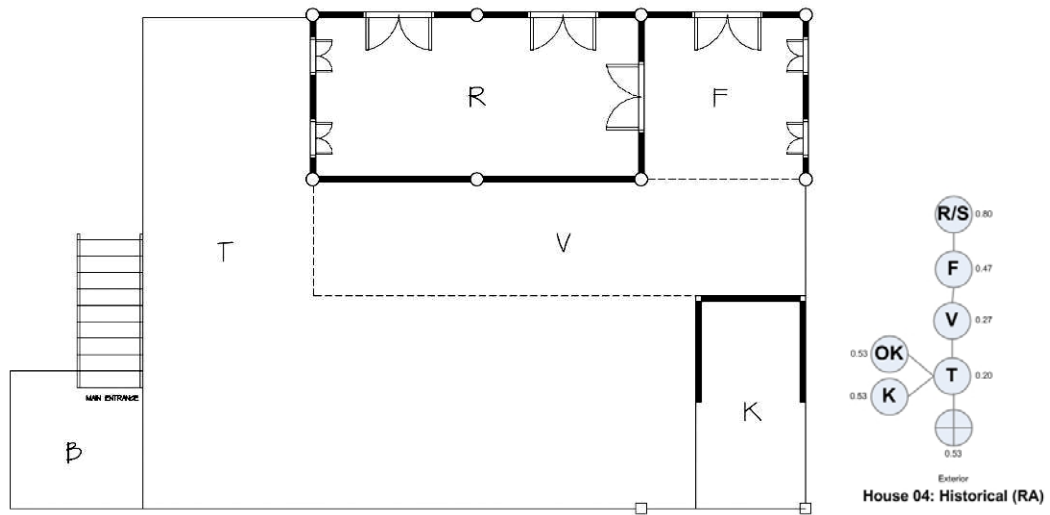


House 03: Contemporary (RA)



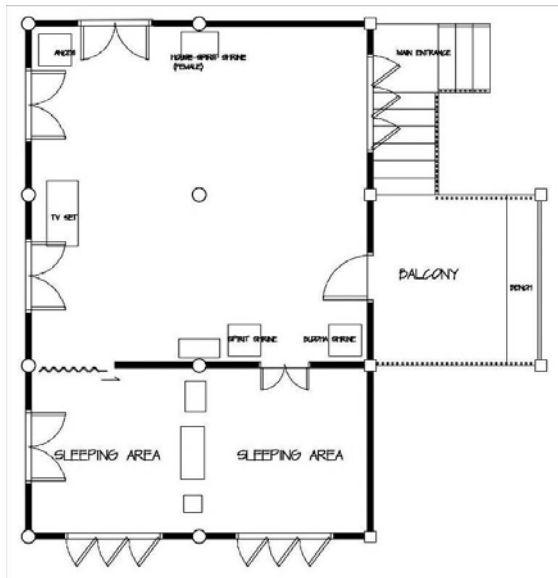
Historical reconstruction

House 03: Floor plan layout & Justified Graphs

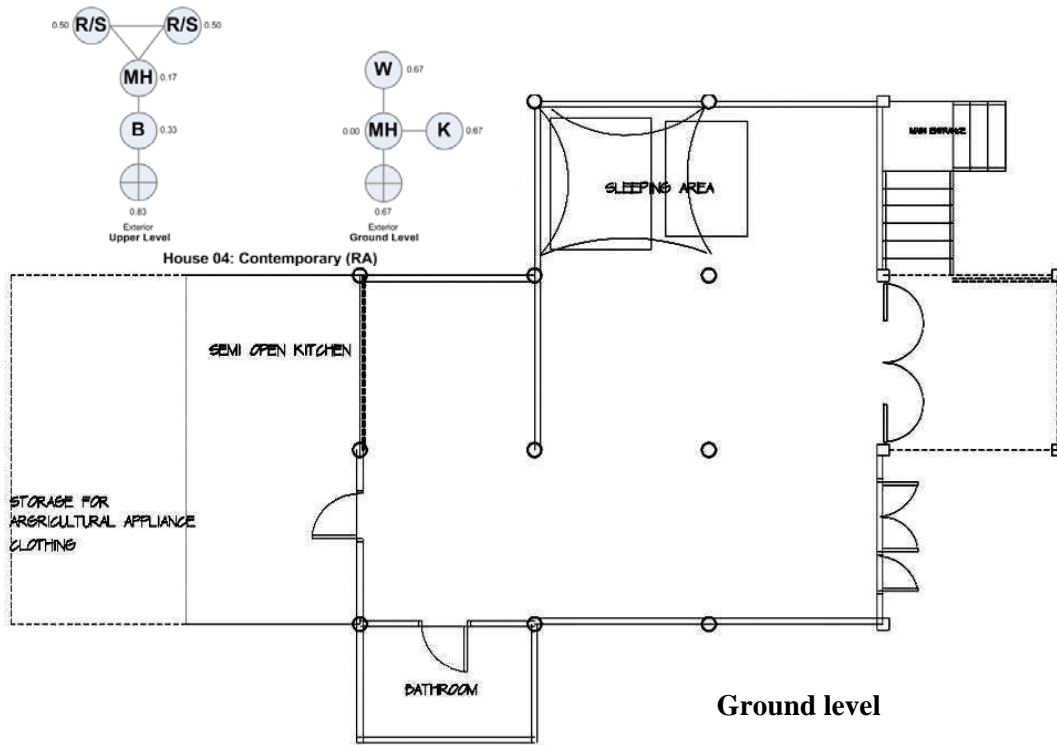


**Historical reconstruction**

**House 04: Floor plan layout & Justified Graphs**



Lower level



Ground level

Contemporary dwelling

House 04: Floor plan layout & Justified Graphs

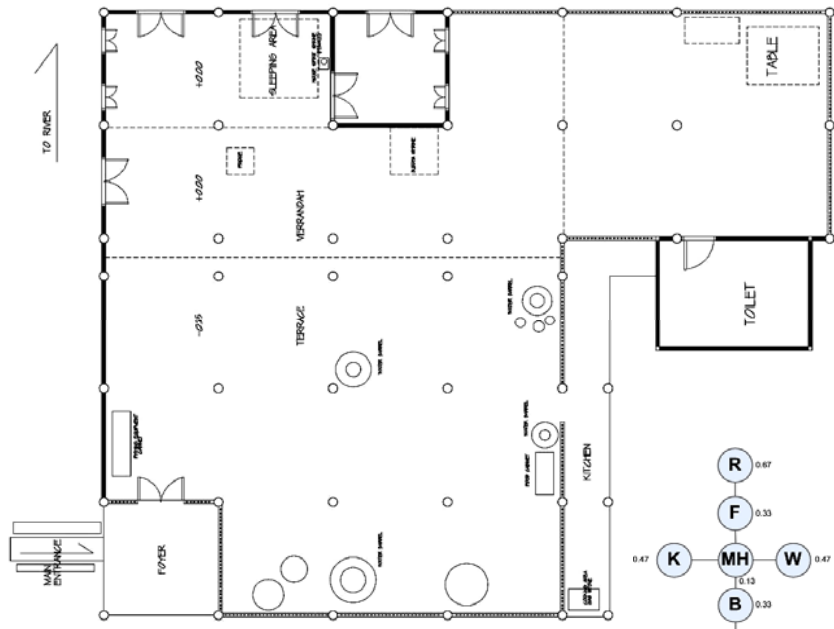




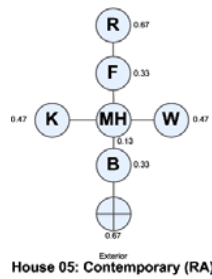
**House 05**



**House 06**



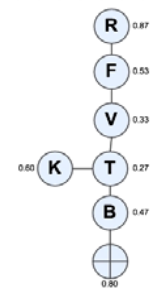
**Contemporary**



Exterior  
**House 05: Contemporary (RA)**

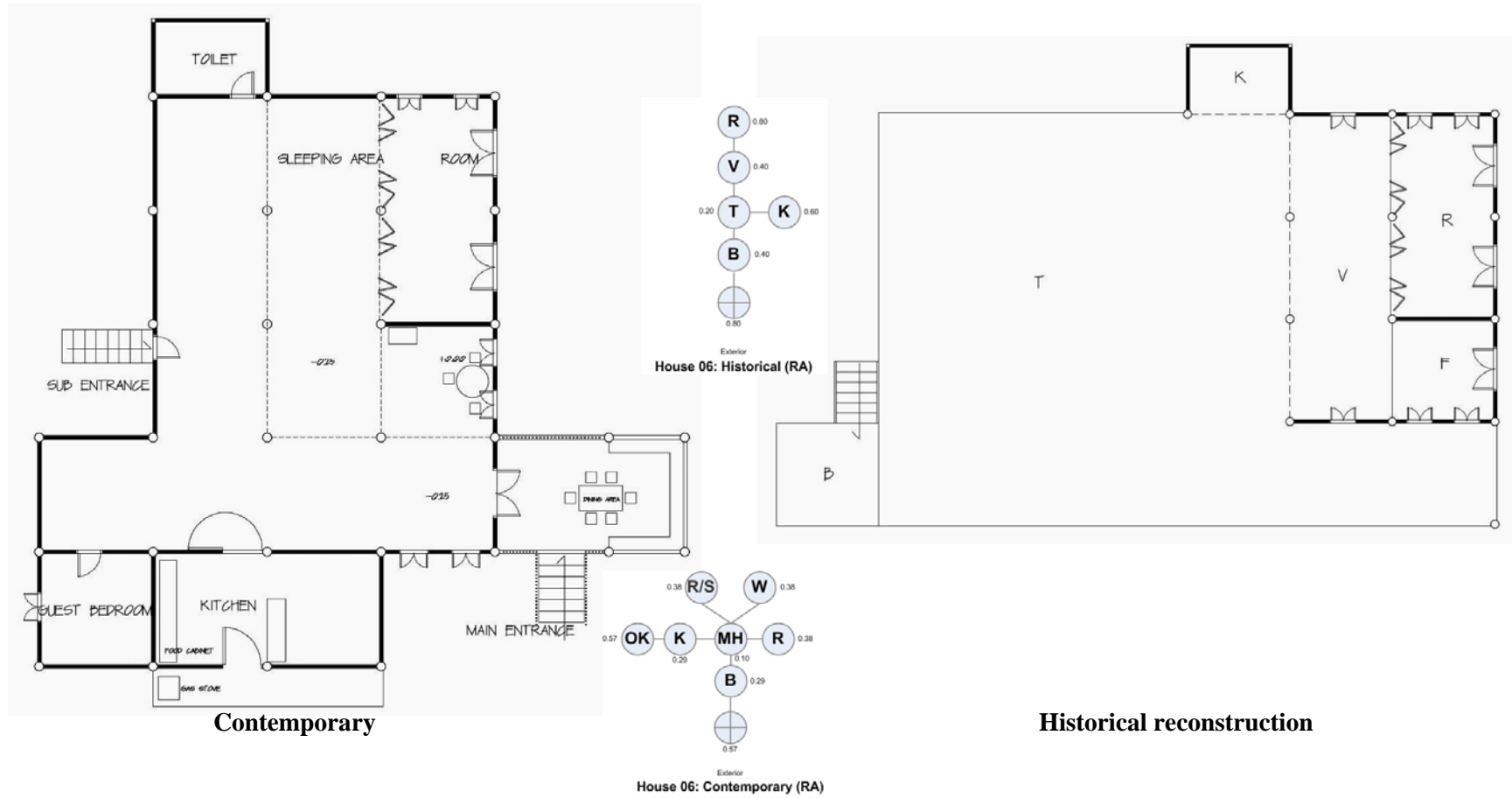


**Historical reconstruction**



Exterior  
**House 05: Historical (RA)**

**House 05: Floor plan layout & Justified Graphs**



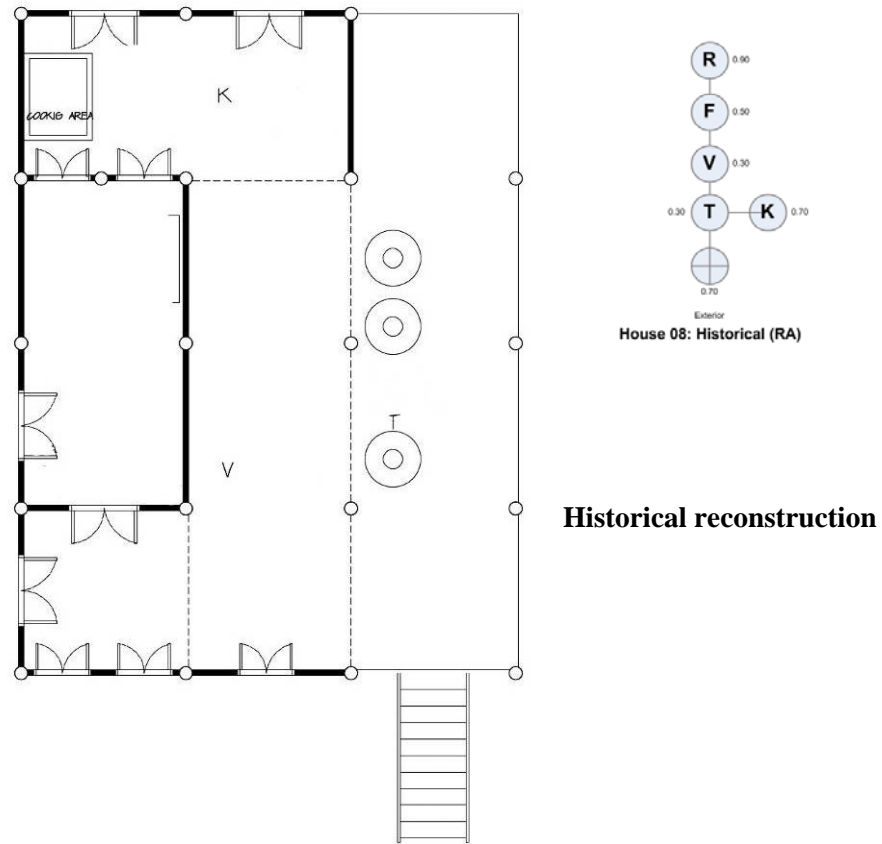
House 06: Floor plan layout & Justified Graphs



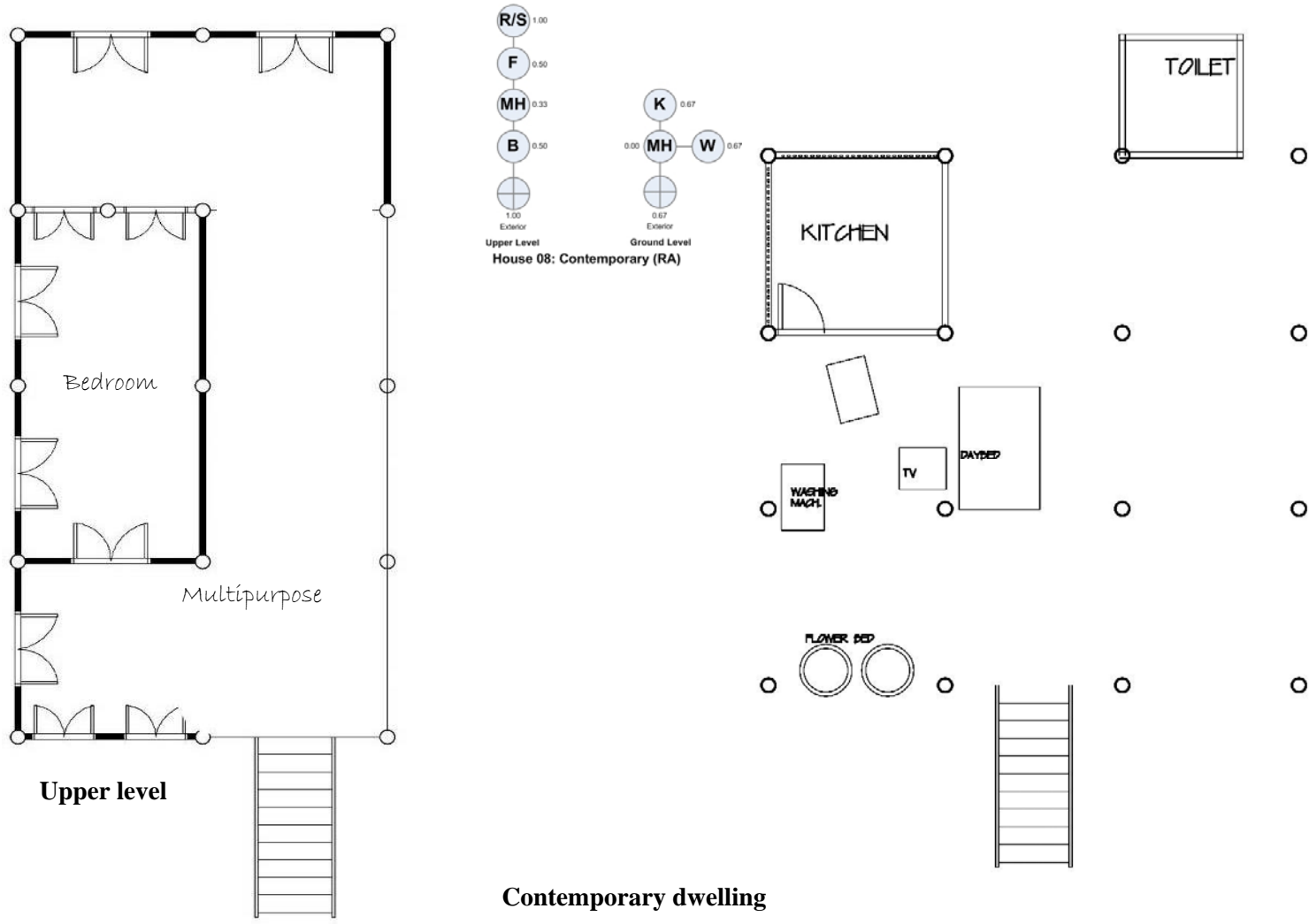
**House 08**



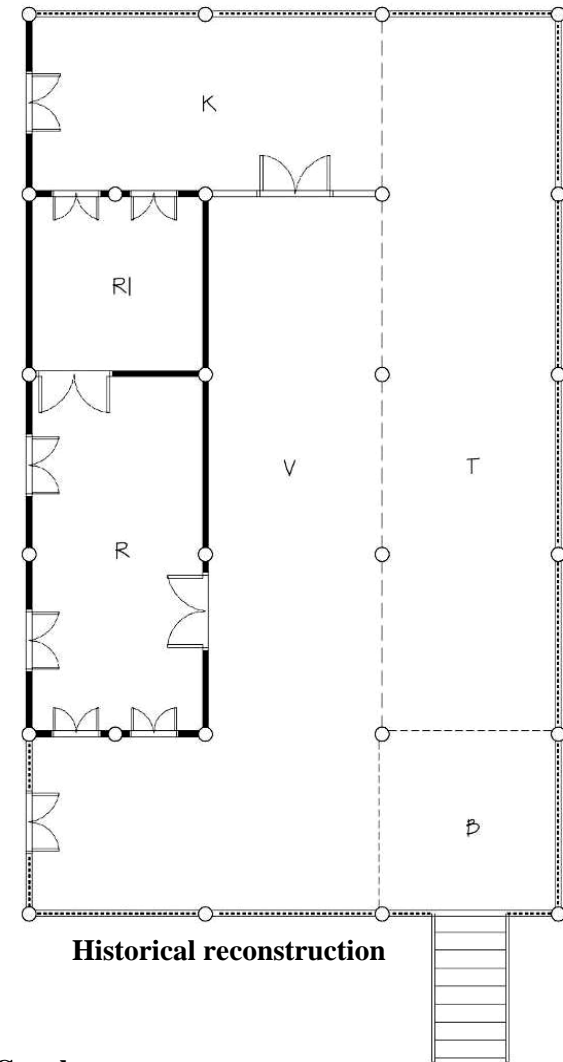
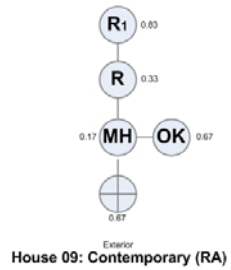
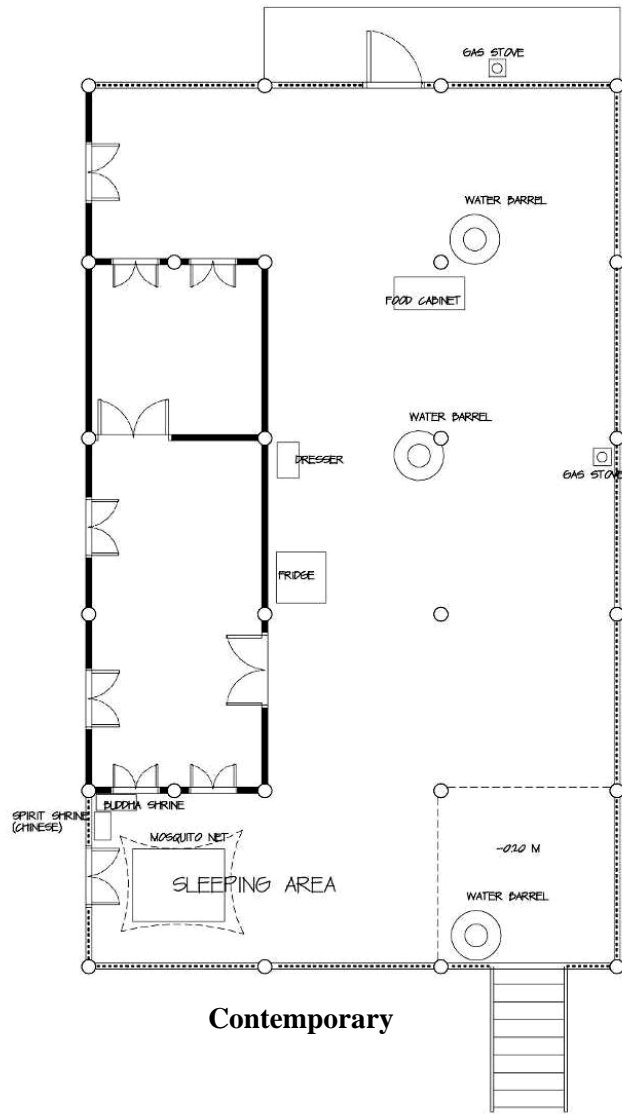
**House 09**



House 08: Floor plan layout & Justified Graphs



House 08: Floor plan layout & Justified Graphs



House 09: Floor plan layout & Justified Graphs

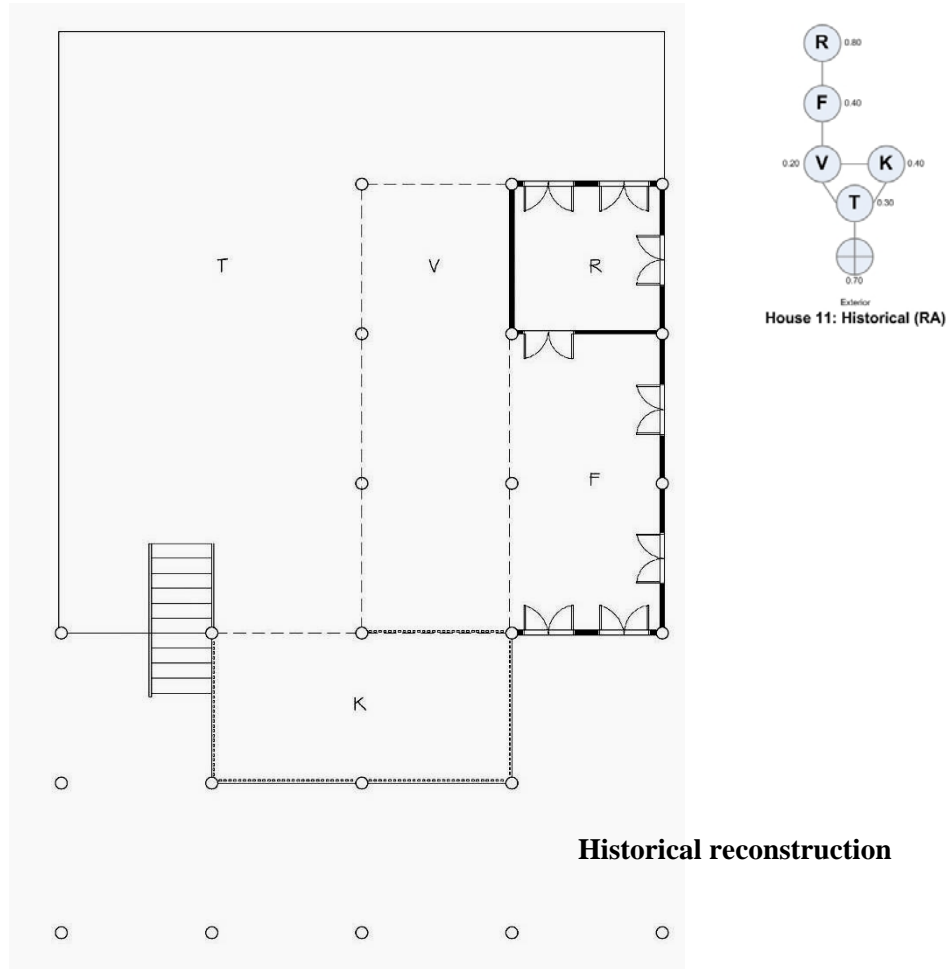


**House 11**

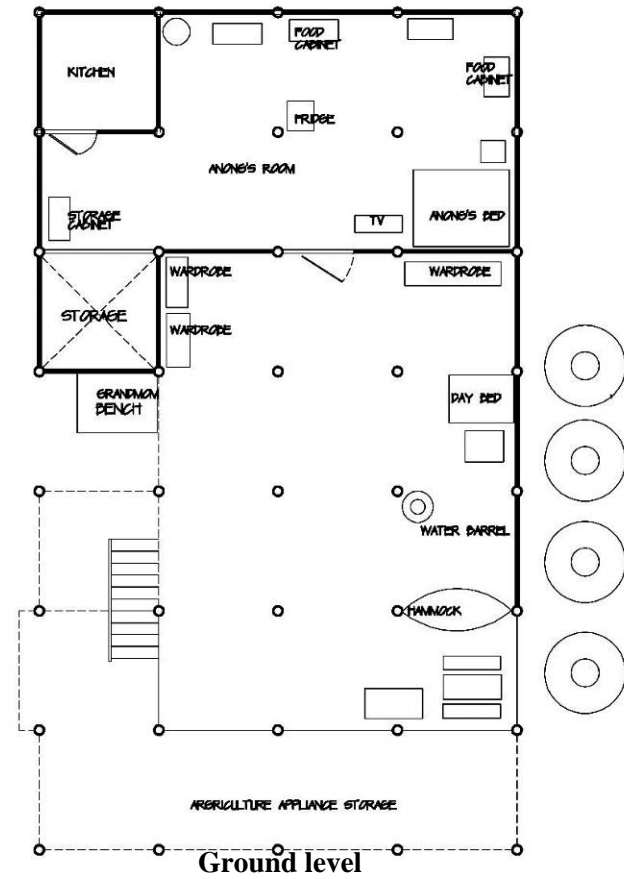
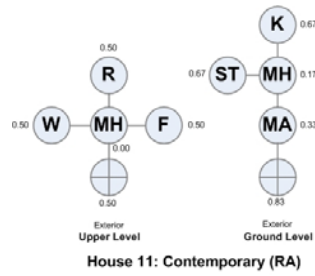
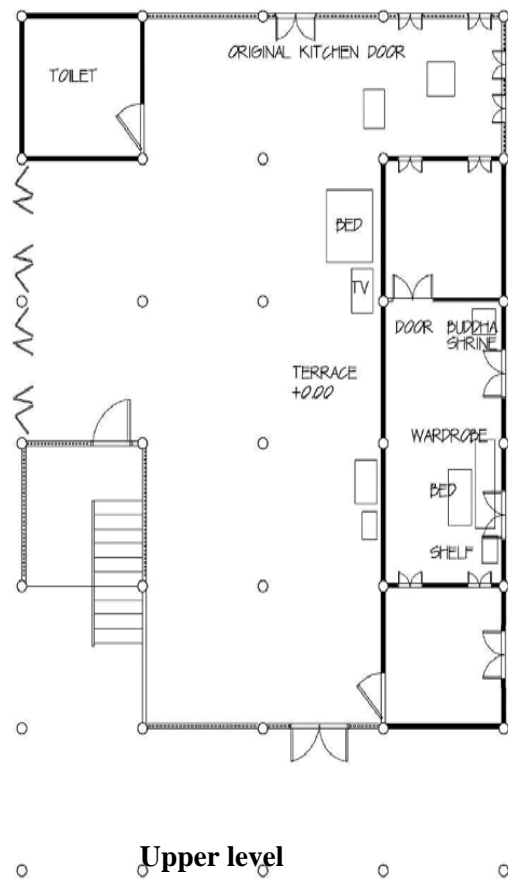


**House 12**





House 11: Floor plan layout & Justified Graphs

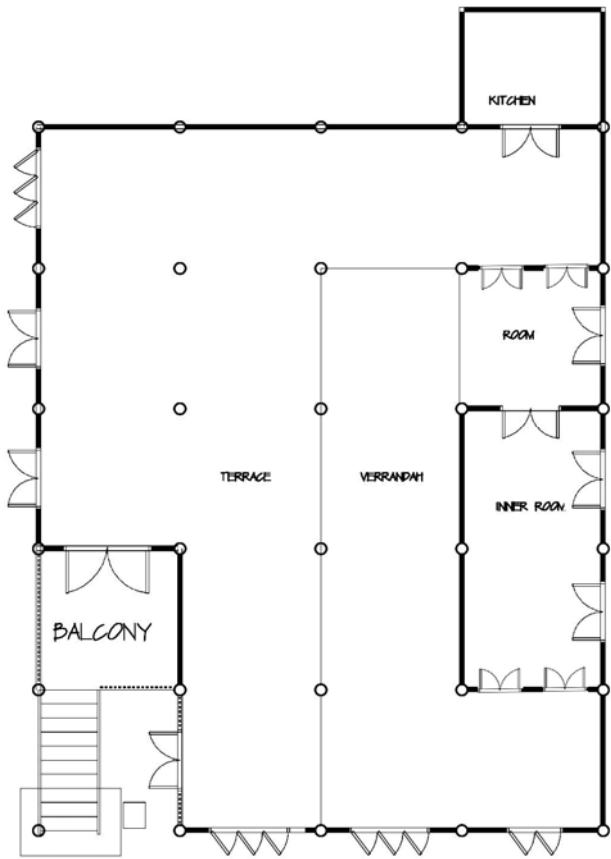


Contemporary dwelling

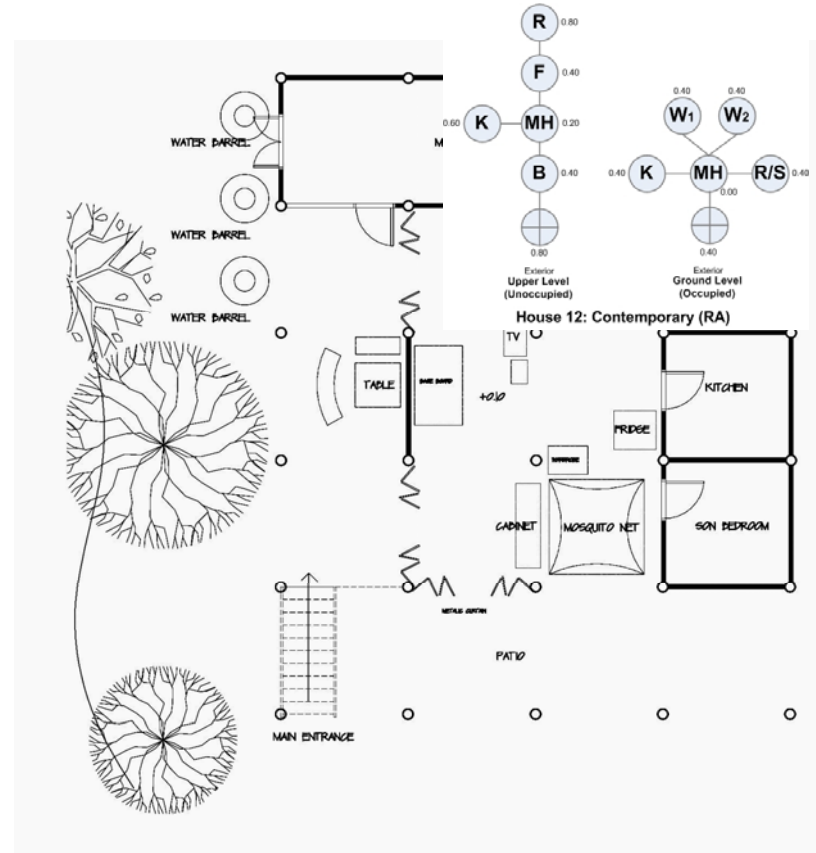
House 11: Floor plan layout & Justified Graphs



House 12: Floor plan layout & Justified Graph



Upper level



Ground level

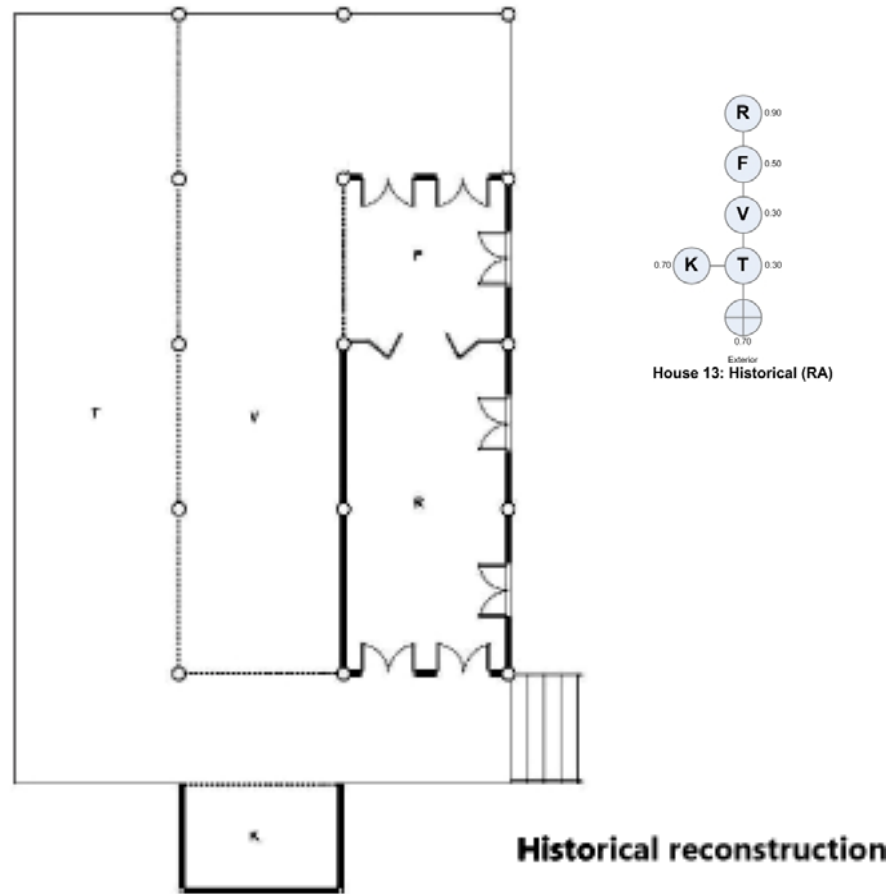
House 12: Floor plan layout & Justified Graphs



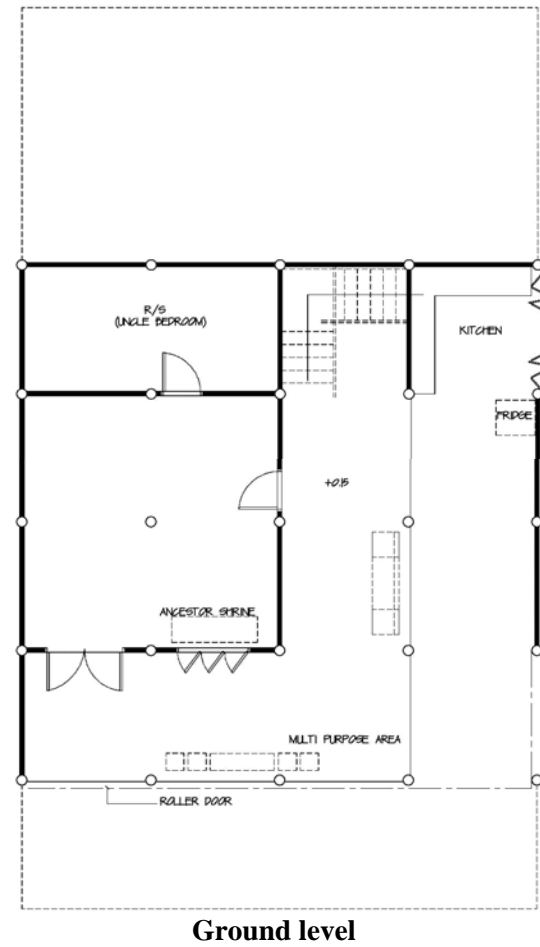
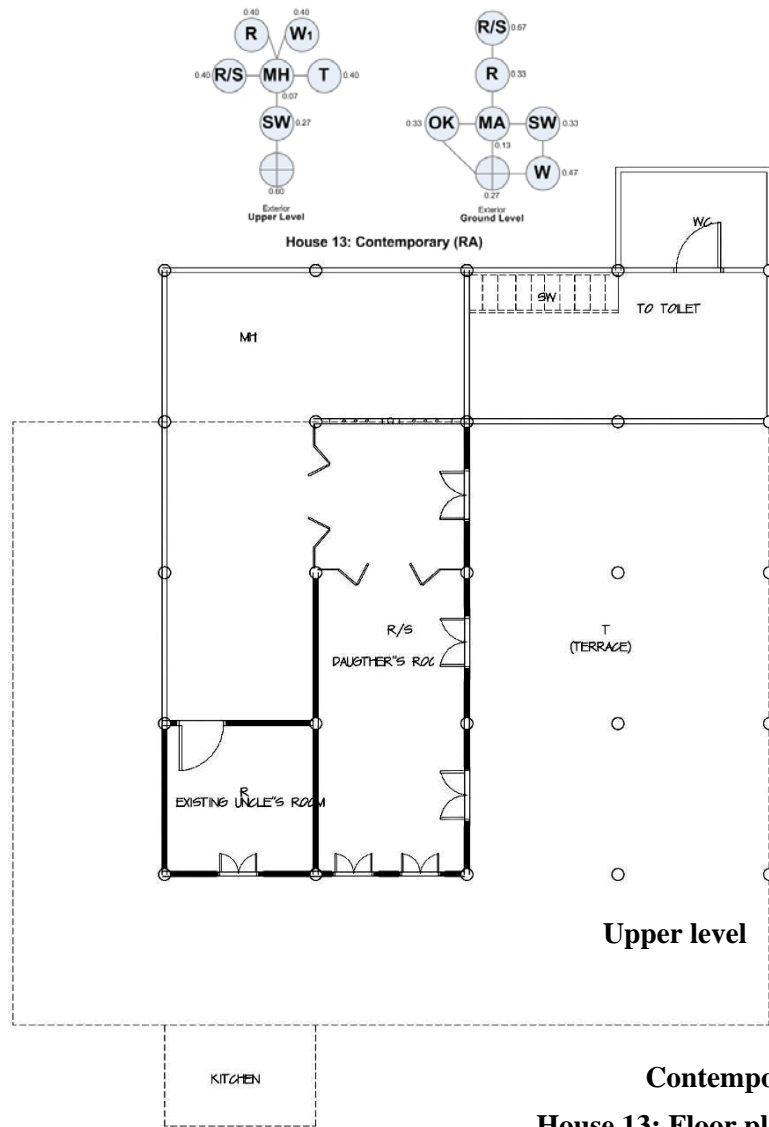
**House 13**



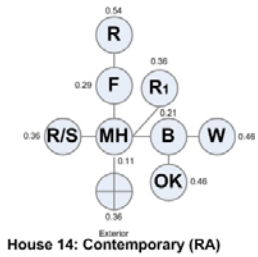
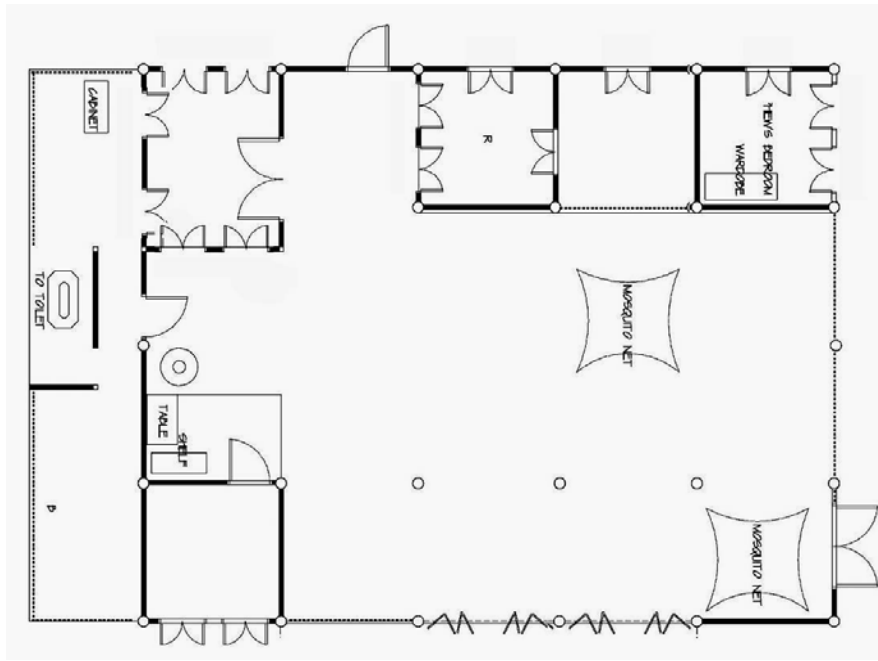
**House 14**



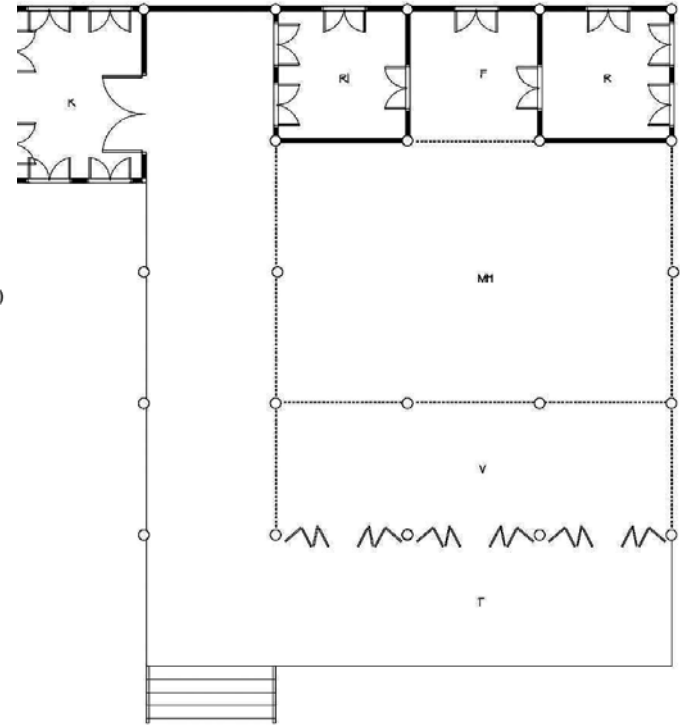
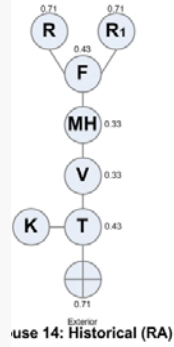
House 13: Floor plan layout & Justified Graph



Contemporary dwelling  
House 13: Floor plan layout & Justified Graphs



Contemporary



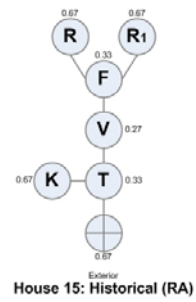
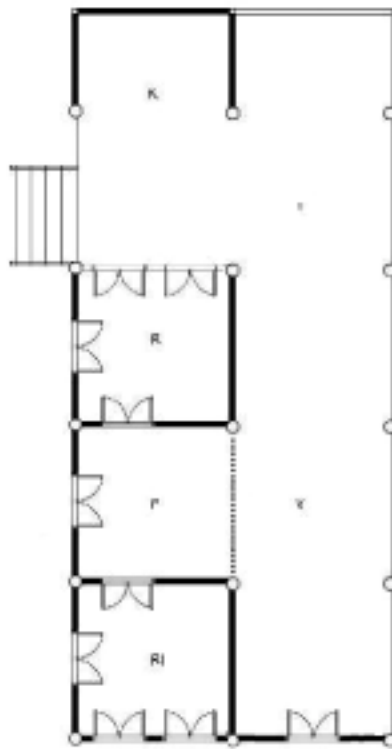
Historical reconstruction

House 14: Floor plan layout & Justified Graphs



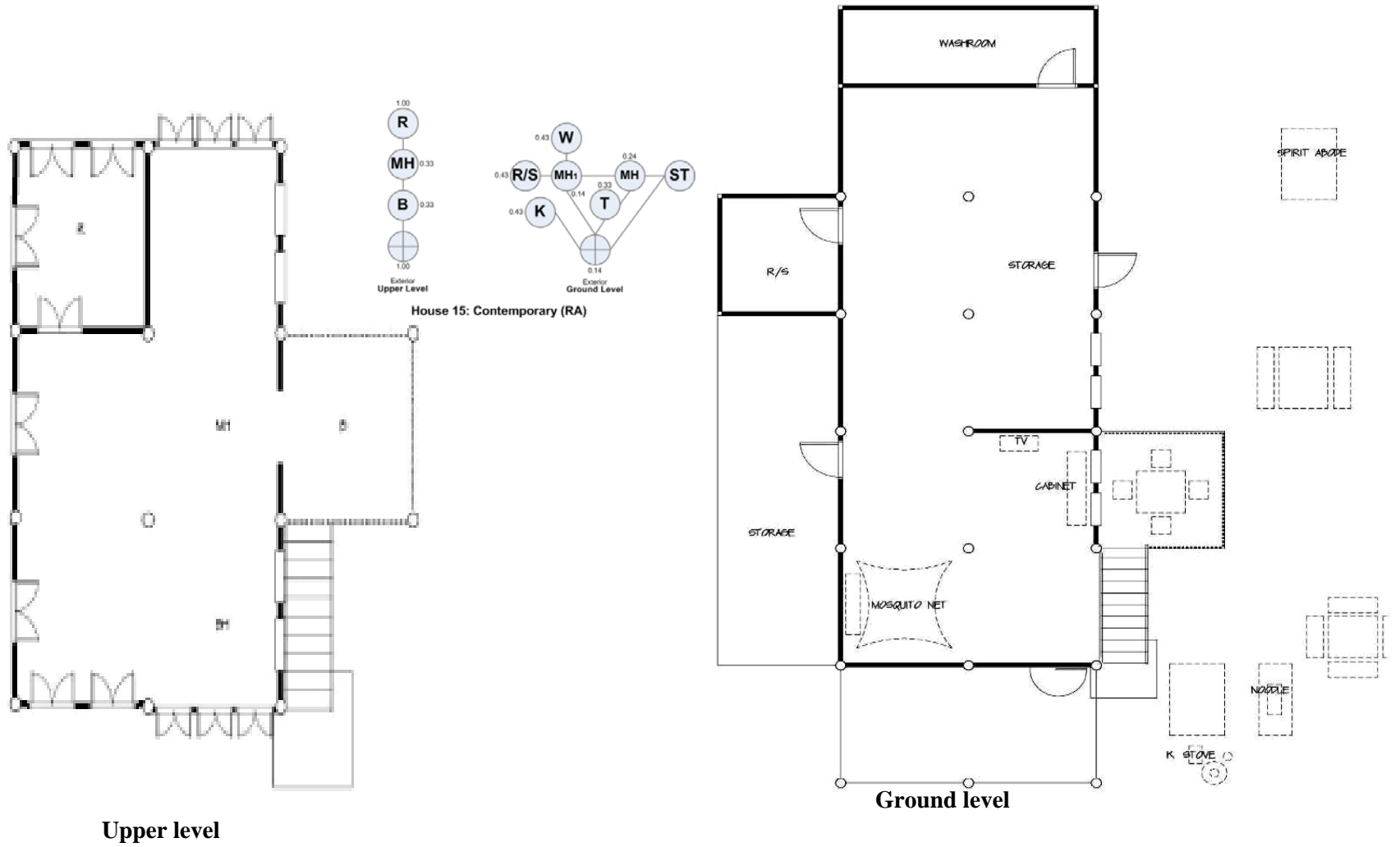


House 15



Historical reconstruction

House 15: Floor plan layout & Justified Graph

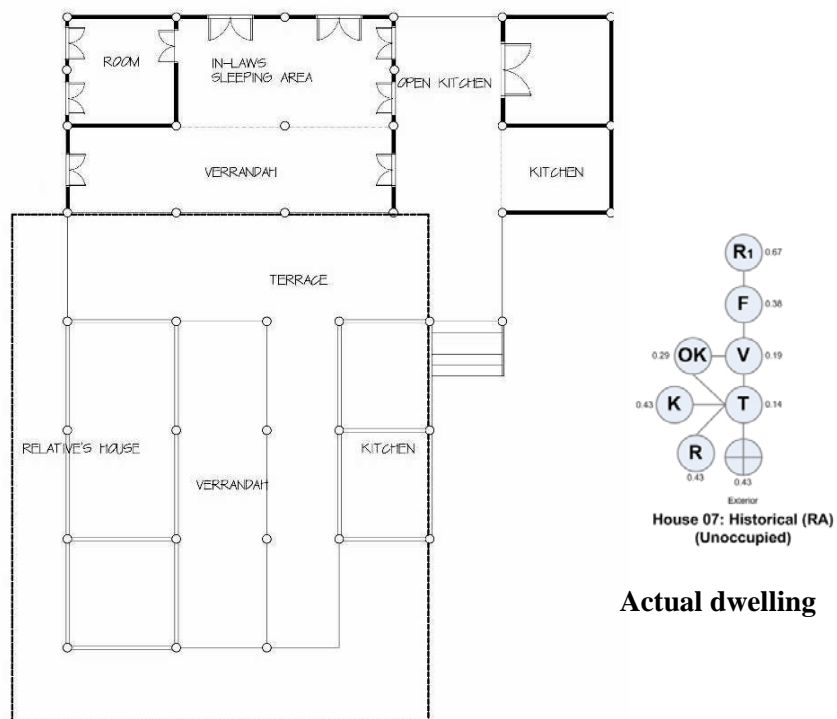


H15: Floor plan layout & Justified Graphs

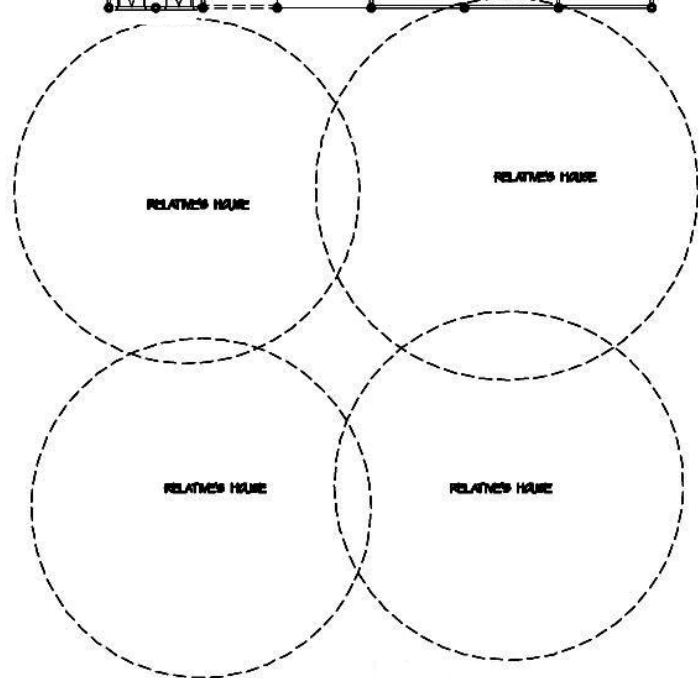
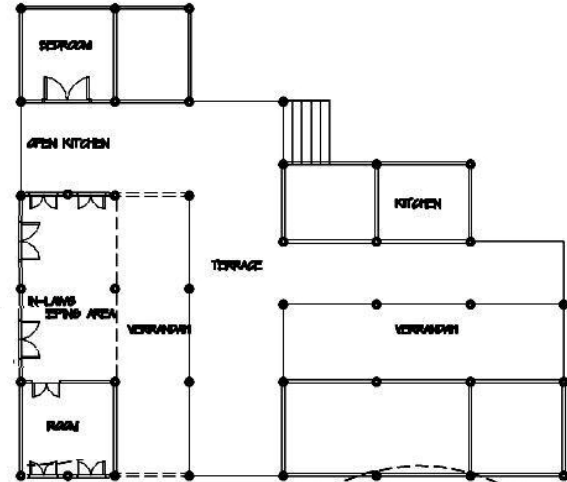
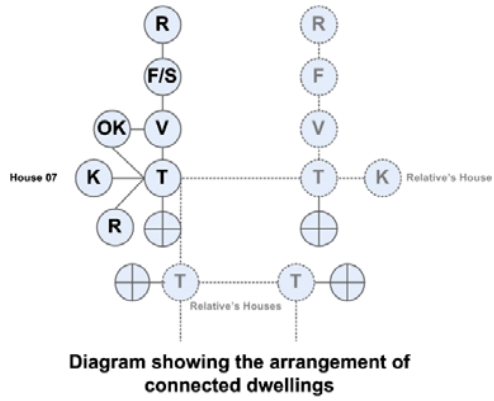
## Historical Dwellings



House 07

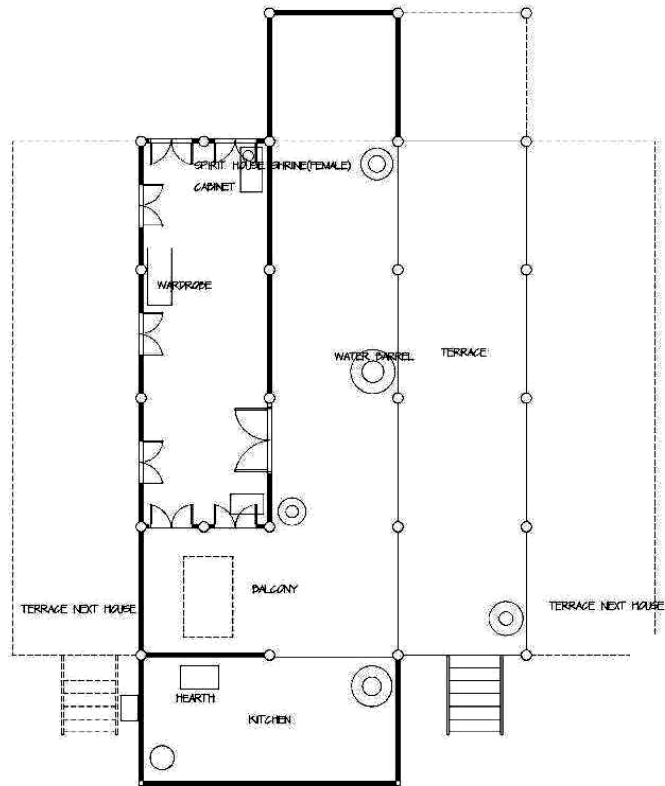


House 07: Floor plan layout & Justified Graph

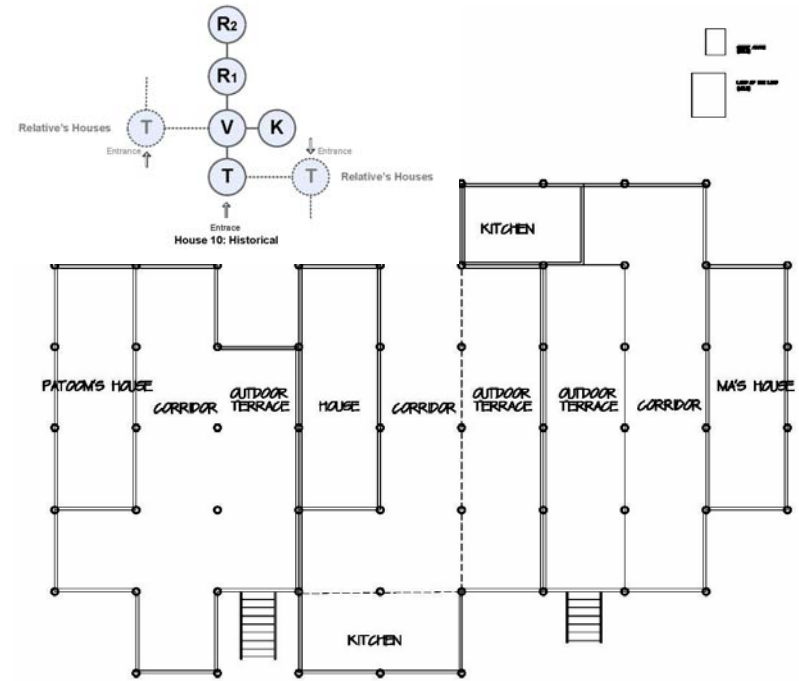


Compound of multiple dwellings

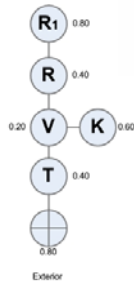
House 07: Floor plan layout & Justified Graph



Floor plan layout



Compound of multiple dwellings

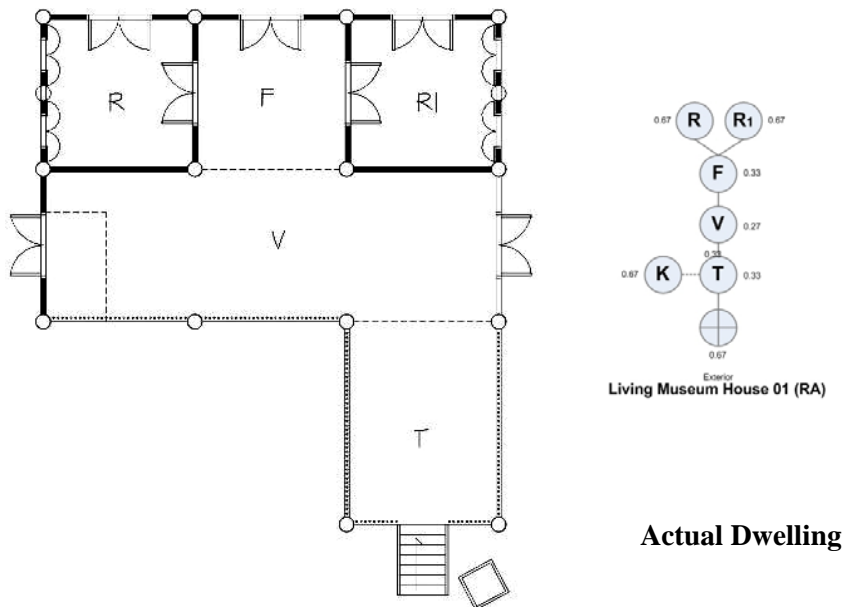


House 10: Historical (RA)

House 10: Floor plan layout & Justified Graph (reconstruction)



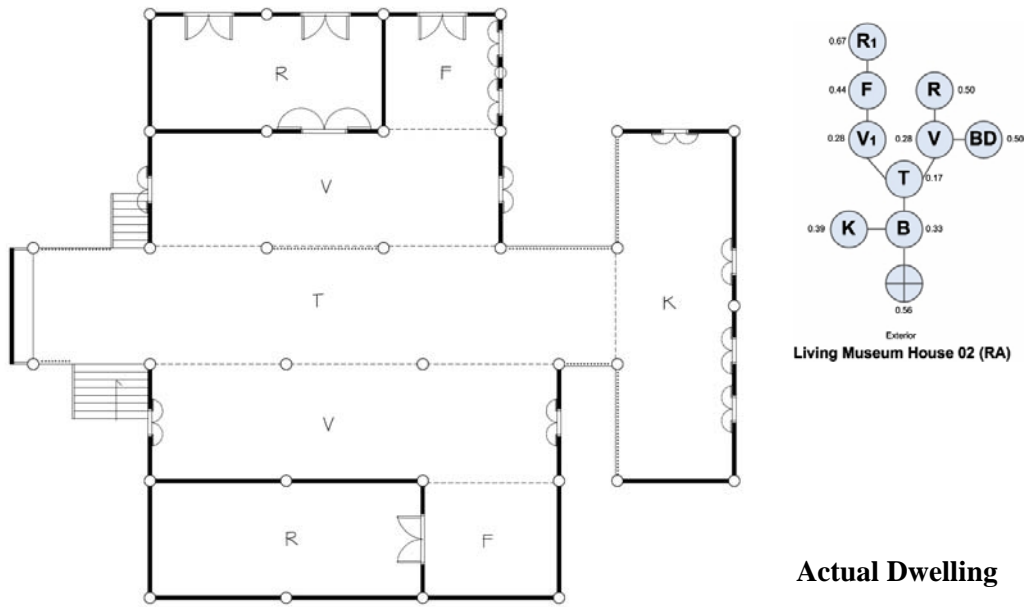
**Museum House 01**



**Museum House 01: Floor plan layout & Justified Graph**



**Museum House 02**



**Living Museum House 02 (RA)**

**Actual Dwelling**

**Museum House 02: Floor plan layout & Justified Graph**

## ***Appendix D: Spatial analysis***



## Definition and Calculation of Spatial Analysis

Two types of Space Syntax variables namely ‘Integration’ and ‘Relative Asymmetry’ (RA), which are the basis for in Space Syntax calculation (Hillier & Hanson, 1984) have been used in describing spatial relationship within the dwellings in this study. The basic concept of Space Syntax concerns with the relationship of the individual spatial point with each other, and the individual to the whole system. It also concerns the pattern of connections and adjacency of spaces, and how they are related to the outside system.

Space syntax has been criticized as highly mechanical, and entrenched in the highly sophisticated computation while forsaking the dimension human value and culture associated with built setting. However it has been shown, in several cases, that the use of Space Syntax in conjunction with the qualitative analysis of the habitats, allow the systematic comparison and statistical analysis of the built setting across the large sample group.

### Mean Depth (MD)

The Mean Depth (**MD**) is a basic quantifiable spatial quality of an individual point in the habitation complex. For each individual point, the computation of its **MD** is derived from the summation of the multiplication of number of points at the different depth levels in the entire building complex. Method for calculation and the logic of MD are presented thoroughly numbers of publications (Hillier & Hanson, 1984; Hanson, 1998; Peoponis, 1985).

The relationship of space within a building complex  $C$  can be represented as graph of points and connecting lines. The depth between point  $a$  and  $b$  of spatial complex  $C$  is noted as  $D(a, b)$ , and is equal to the minimum number of connections that must be used to reach  $b$  from  $a$ , or  $a$  from  $b$ . Then;

The **Mean Depth (MD)** of point  $a$  in a complex  $C$ , where  $K$  = number of points in  $C$ , is defined by the expression:

$$\mathbf{MD}(a,C) = \frac{\sum_{bi \in C} D(a, bi)}{K - 1}$$

The ‘Mean Depth’ expresses the average of shallow or deep a position of an individual space in relation to one another and to that of the entire complex. The **MD** value is localized and cannot be compared across the building complex.

The **MD** value can be calculated with and without the exterior. When the exterior is included into the calculation, the outside of the complex is simply counted as one additional point in the calculation. The marginal difference on the **MD** values, (as well as the Integration) when the exterior is disregarded in the calculation, is related to spatial configuration of a built setting where the interior-to-exterior spaces are well integrated; Hanson (1998) coins the description of this type of design as ‘inhabitant-visitor interface.’ On the contrary, when there is no effect in omitting the exterior from the calculation, it means that the exterior has very little effect on the overall integration of the complex or the interior space is very well segregated from the outside world; this is an inhabitant-inhabitant interface dwelling design.

### **The Relative Asymmetry (RA) and the Real Relative Asymmetry (RRA)**

Both of the variable Relative Asymmetry (**RA**) and spatial Integration (**I**) express the degree to which the particular space is included or excluded in to the whole dwelling complex. The Relative Asymmetry (**RA**) value indicates the relative position as well as the integration of the individual space to the entire spatial categories that made up the whole buildings.

The **Relative Asymmetry** (**RA**) of a point *a* in a complex *C*, is defined by the expression:

$$\mathbf{RA}(a, C) = \frac{2[MD(a, C) - 1]}{K - 2}$$

The Relative Asymmetry (**RA**) values cannot be compared across buildings, but are very useful for comparing the spatial integration within the individual setting, especially in the dwelling with very small numbers of spaces ( $k \geq 5$ ). The interpretation of the **RA** value is somewhat counter intuitive; the lower the **RA** value, the higher the degree of integration of that particular space.

The **Real Relative Asymmetry (RRA)** is a normalized version of RA, which allows it to be compared across the building systems. The **RRA** of a point  $a$  in a complex  $C$  (for all  $a, C; 0 \leq \mathbf{RA}(a, C) \leq 1$ ) is defined by the expression:

$$\mathbf{RRA}(a, C) = \frac{6.644k \cdot \log_{10}(k+2) - 3.17k + 2}{k^2 - 3k + 2}$$

or

$$\mathbf{RRA} = \mathbf{RA}/\mathbf{D}_k$$

where  $\mathbf{D}_k$  represents D value of  $k$  number of spaces.

The **RRA** value ranges from 0 to 1. The interpretation of the **RRA** is similar to that of the RA: the lower the **RRA** value, the higher the degree of integration of that particular space.

### The Integration value

The **Integration** value is more universal, and the interpretation is straightforward. The high **Integration** value coincides with the space with shallow and ringy quality, and the low **Integration** value is associated with deep and tree-like spatial quality. In simple terms, the higher the numbers indicate the higher level of integration of the space to the whole unit. The **Integration** value is universal and normalized, therefore can be used for comparison across the built setting.

$$\mathbf{Integration} = \mathbf{D}_k/\mathbf{RA}$$

$$\text{where } \mathbf{D}_k = \frac{2 \left\{ k \left\{ \log_2 \left\{ \frac{k+2}{3} \right\} - 1 \right\} + 1 \right\}}{(k-1)(k-2)}$$

or

$$\mathbf{Integration} = 1/\mathbf{RRA}$$

For the efficiency, the table showing D-values for  $k$  spaces is presented in Hillier and Hanson's (1984) book "The Social Logic of Space" (p.112). However efficient the spatial Integration variable may be, it has a significant limitation. That is it can only be computed from the dwelling with more than 5 spaces ( $k \geq 5$ ).

The **Mean Integration** value of a complex is derived from the average of the integration value of each individual point within the complex. According to Hanson (1998), the shallow and ringy complex has the lowest mean integration, while the deep tree-like complex structure has the higher over all mean integration.<sup>5</sup>

The study of **Integration** pattern has been very useful for studying the pattern of dwelling and settlements in the field of Vernacular Architecture as well as Design Studies. A researcher can identify common cultural traces, shared ideas or belief about domestic life that are manifested in the architecture, across built settings, by tracing the Integration pattern among a large sample of plans. The numerical consistency found among the Integration value of spatial types that constitute the habitation complex, derived from samples of plan from a region or society, can be regarded as a 'cultural pattern' to which Hillier and Hanson (1984) have, borrowed the evolutionary biology concept, called the '*genotype*.'

### **The Spatial Analyses Methods for this study**

Due to the popularity and efficiency of Space Syntax method, since the late 1980s, the Space Syntax research community has rapidly expanded. Its advocates have ceaselessly developed several advanced and sophisticated computer program such as 'Depth Map' and the like, which enable the automate calculation of spatial of spatial values directly from AUTOCAD drawings of the house. On a larger scale, many have integrated the Space Syntax features into the GIS system for the analysis of urban form.

This study concentrates on the spatial organization of the Thai houses in which have minimal number of spaces. It aims to find out whether the genotype across the traditional Thai houses of the Central region exists. The second objective also involves the comparison in the pattern of the spatial organization across the time to uncover the pattern of changes and the extent to which the dwelling has been modified by its occupants. Thus the comparison of a few Syntactic values namely the **RA**, and Integration are sufficient to clarify the central inquiries of the study.

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<sup>5</sup> Discussion and calculation method of basic Space Syntax value are thoroughly presented in Hillier and Hanson's (1984) "The Social Logic of Space," and Hanson's (1998) "Decoding Homes and Houses" (p. 24-32).

Two types of floor plans are used as raw materials for performing spatial analysis of each house; a floor plan of a current (or modified) of the house, and a reconstruction of historic floor plan of the same house. The following steps are carried out to obtain the Space Syntax value of the spaces within the house:

Determined spatial categories within the dwellings, both the modified and the historic houses

Construct the justified graphs of the floor plans

In put the spatial relation of the spaces, obtained from the justified graph, into Mathematica<sup>®</sup> computation codes to get the **MD** value of each individual space within the house.

Calculate **RA**, **RRA**, and Integration value from the **MD** value obtained.

In this study, the categorizations of spatial type within the houses are based on the semantic description of each individual space commonly used by the inhabitants. The comprehensive rationale for spatial categorization is presented in Chapter 8: The Interior of the House.

The Mean Depth (**MD**) value are performed by codes, prepare by Dr. Sonit Bafna<sup>6</sup>, to be used with Mathematica<sup>®</sup> Software. The **RA**, **RRA**, and **Integration** value are manually calculated, from the **MD** value derived from the aforesaid computation, by using Microsoft Excel.

It should be noted that ‘exterior space’ has been included into all of the calculation of the **MD**, **RA**, **RRA**, **Integration** value of the dwellings within this study. The rationale for including the exterior space is due to the minimal numbers of spaces ( $k$ ) in the Central Thai house. Since the spatial categories of the Central Thai house is invariably homogeneous; some of the historic houses contain less than 5 spatial categories. As previously noted, the D-values for the calculation of RRA are only available when numbers of spaces ( $k$ ) are greater than 4. Thus, this has made impossible the computation of RRA of the house with less than 5 spaces.

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<sup>6</sup> Dr. Sonit Bafna is a member of the doctoral program faculty at Georgia Tech's College of Architecture, associated primarily with the Theory & Criticism and the Design Morphology streams.

A brief explanation for the non existence of D-values for less than 4 spaces is rested on the logic behind the normalization of the **RA**. Since the **RA** value is localized, which means that all the values can only be compared among the spaces within the same complex, its application is quite limited when one needs to examine the pattern of spatial organization a larger context. To enable the comparison across built settings, the RA value must be normalized. This can be done by compare the **RA** valued, derived from the floor plan of interests, with the **RA** value of a '*diamond-shape*' pattern (of justified graph with similar number of spaces).<sup>7</sup>

However, it is worth noting that there is only minimal difference in the **RA** or **RRA** values of the spaces within the Central Thai houses in the calculation with and without exterior. This is because almost of all of the houses, both the historic and the modified versions have only one entrance from the exterior. Their spatial compositions within these dwellings represent a deep tree-like or linear structure that promotes segregation between the inhabitants from the visitor from the outside world. Thus, the inclusion of the exterior in the spatial analysis of the house in this study is purely for practical purpose.

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<sup>7</sup> Further discussion on D-Values for K spaces is presented in Hillier and Hanson (1984), p111-112.

**Table 28: Comparison of ranked order of integration of functions in historic dwellings.**

Historic Dwellings								
House Number	Integration Order with exterior Integration Value with exterior							
<b>H01</b>	ex 0.46	k=r1=r2 0.55	b 0.69	t1=f1=f2 0.92	t 1.10	v 1.84		
<b>H02</b>	ex 0.46	f=r 0.57	k 0.64	b 0.85	v 1.27	t 1.70		
<b>H03</b>	r 0.39	ex 0.43	k 0.57	f 0.64	b 0.73	v 1.02	t 1.27	
<b>H04</b>	r/s 0.43	ex=k=ok 0.64	f 0.73	v 1.27	t 1.70			
<b>H05</b>	r 0.39	ex 0.43	k 0.57	f 0.64	b 0.73	v 1.02	t 1.27	
<b>H06</b>	ex=r 0.44	k 0.58	b=v 0.87	t 1.75				
<b>H07</b>	r1 0.49	ex=k=r 0.77	f 0.86	ok 1.15	v 1.72	t 2.30		
<b>H08</b>	r 0.39	ex=k 0.50	f 0.70	t=v 1.16				
<b>H09</b>	r1 0.39	ex 0.43	k 0.57	r 0.64	b 0.73	v 1.02	t 1.27	
<b>H10</b>	ex=r1 0.44	k 0.58	t=r 0.87	v 1.75				
<b>H11</b>	r 0.44	ex 0.50	k=f 0.87	t 1.16	v 1.75			
<b>H12</b>	r 0.39	ex 0.43	k 0.57	f 0.64	b 0.73	v 1.02	t 1.27	
<b>H13</b>	r 0.39	ex=k 0.50	f 0.70	t=v 1.17				
<b>H14</b>	ex=k=r=r1 0.46	t=f 0.77	v=mh 0.98					
<b>H15</b>	ex=k=r=r1 0.51	t=f 1.02	v 1.27					
<b>MH01</b>	ex=k=r=r1 0.51	t=f 1.02	v 1.27					
<b>MH02</b>	r1 0.46	ex 0.55	bd=r 0.61	f 0.69	k 0.79	b 0.92	v=v1 1.10	t 1.84

**Table 29: Comparison of ranked order of integration of functions in the contemporary dwellings.**

Modified Dwellings							
House Number	Integration Order with exterior Integration Value with exterior						
<b>H01</b>	r 0.65	ex=b1 0.85	ps 1.00	ps1=w 1.00	f 1.22	b=k 1.38	mh 3.67
<b>H02</b>	ex=r 0.66	ps1=ps2 0.74	k=st=wc 1.02	b=f 1.21	pf 1.48	mh 3.32	
<b>H03</b>	ex=ok=r/s 0.53	bd 0.77	b=k=f/s 0.98	mh 2.30			
<b>H04</b> Upper Level	ex 0.42	r/s1=r/s2 0.70	b 1.06	mh 2.11			
<b>Ground**</b>	n/a						
<b>H05</b>	ex=r 0.51	k=w 0.73	b=f 1.02	mh 2.55			
<b>H06</b> Upper Level	ex=ok 0.57	wc=r/r/s 0.86	b=k 1.15	mh 3.44			
<b>H08</b> Upper Level	ex=r/s 0.35	b=f 0.70	mh 1.06				
<b>Ground**</b>	n/a						
<b>H09</b>	r1 0.42	ex=ok 0.53	r 1.06	mh 2.11			
<b>H11</b> Upper Level	ex=wc=f=r 0.70	mh n/a					
<b>Ground</b>	ex 0.42	k=st 0.53	ma 1.06	mh 2.11			
<b>H12</b>	ex=r 0.44	k 0.59	b=f 0.88	mh 1.76			
<b>H13</b> Upper Level	ex 0.57	t=w=r/r/s 0.85	sw 1.27	mh 5.10			
<b>Ground</b>	r/s 0.51	w 0.73	ok=sw=r 1.02	ex 1.27	ma 2.55		
<b>H14</b>	r 0.59	ok=w 0.68	ex 0.89	r1=r/s 0.89	f 1.11	b 1.48	mh 2.96
<b>H15</b> Upper Level **	n/a						
<b>Ground</b>	k=w=r/s 0.77	t=st 0.98	mh 1.38	ex=mh1 2.30			

\*Dwellings without modification on the ground area

\*\*Number of spaces (k) is less than 4



**Table 30: Comparison of "Spatial Integration" within the historic and the contemporary homes**

Age Of House	Years In House	Historical						Contemporary				
		House Number	Level	Number of Spaces	Mean	Min	Max	Level	Number of Spaces	Mean	Min	Max
110	70	H01	U	10	0.85	<b>b=k=f=r2</b> 0.46	<b>v</b> 1.84	U	10	1.30	<b>r</b> 0.65	<b>mh</b> 3.67
n/a	50	H02	U	7	0.87	<b>ex</b> 0.46	<b>t</b> 1.7	U	11	1.19	<b>ex=r</b> 0.66	<b>mh</b> 3.32
>100	73	H03	U	7	0.72	<b>r</b> 0.39	<b>t</b> 1.27	U	8	0.95	<b>ex=ok=r/s</b> 0.53	<b>mh</b> 2.3
n/a	50	H04	U	7	0.86	<b>r/s</b> 0.43	<b>t</b> 1.7	U	4	1.00	<b>ex</b> 0.42	<b>mh</b> 2.11
								G	5			
n/a	39	H05	U	7	0.72	<b>r</b> 0.39	<b>t</b> 1.27	U	7	1.01	<b>ex=r</b> 0.51	<b>mh</b> 2.55
85	52	H06	U	6	0.82	<b>ex=r</b> 0.44	<b>t</b> 1.75	U	8	1.18	<b>ex=ok</b> 0.57	<b>mh</b> 3.44
110	50	H07**	U	8	1.1	<b>r1</b> 0.49	<b>t</b> 2.3	n/a				
130	63	H08	U	6	0.73	<b>ex=ok</b> 0.53	<b>t=v</b> 1.16	U	5	0.63	<b>ex=r/s</b> 0.35	<b>mh</b> 1.06
			G					G	4	**	**	**
>100	63	H09	U	7	0.72	<b>r1</b> 0.39	<b>t</b> 1.27	U	5	0.93	<b>r</b> 0.42	<b>mh</b> 2.11
>100	n/a	H10**	U	6	0.82	<b>ex=r</b> 0.44	<b>v</b> 1.75	n/a				

(Continued)

Age Of House	Years In House	Historical						Contemporary				
		House Number	Level	Number of Spaces	Mean	Min	Max	Level	Number of Spaces	Mean	Min	Max
68	58	H11	U	6	0.93	<b>r</b> 0.44	<b>v</b> 1.75	U	5	n/a	0.7	0.7
								G	5	0.93	ex 0.42	mh 2.11
n/a	45	H12	U	7	0.72	0.39	1.27	U	6	0.83	0.44	1.76
								G	6	n/a	0.88	0.88
>80	69	H13	U	6	0.74	<b>r</b> 0.37	<b>t=v</b> 1.17	U	7	1.48	<b>ex</b> 0.57	<b>mh</b> 5.1
150	81	H14	U	8	0.67	<b>ex=k=r=r1</b> 0.46	<b>v=mh</b> 0.98	U	9	1.13	<b>r</b> 0.59	<b>mh</b> 2.96
>100	9	H15	U	7	0.76	<b>ex=k=r=r1</b> 0.51	<b>v</b> 1.27	U	4	**	**	**
								G	8	1.28	k=w=r/s 0.77	ex=mh 2.30
n/a		MH1**	U	7	0.76	<b>ex=k=r=r1</b> 0.51	<b>v</b> 1.27	n/a				
n/a		MH2**	U	10	0.87	<b>r1</b> 0.46	<b>t</b> 1.84	n/a				

\*\* Historical home only



(Continued)

House Number	Total Number of Spaces w/ Ground FL	Total Number of Spaces w/ Exterior	Balcony	Buddha Shrine Area	Foyer	Kitchen	Multipurpose Area	Multipurpose Hall	Open Kitchen	Partitioned Sleeping Area	Room	Stair Well	Storage	Terrace	Verandah	W.C.
6h	7	6u	•			•					•			•	•	
		1g					•									
6c	9	8u	•					•			••					•
		1g					•									
7h	9	8u			••	•			•		••			•	••	
		1g					•									
8h	7	6u			•	•					•			•	•	
		1g					•									
8c	9	5u	•		•			•			•					
		4g				•		•								•
9h	8	7u	•			•					••			•	•	
		1g					•									
9c	6	5u						•	•		••					
		1g					•									
10h	7	6u				•					••			•	•	
		1g					•									
11h	7	6u			•	•					•			•	•	
		1g					•									
11c	10	5u			•			•			•					•
		5g				•	•	•					•			

(Continued)

House Number	Total Number of Spaces w/ Ground FL	Total Number of Spaces w/ Exterior	Balcony	Buddha Shrine Area	Foyer	Kitchen	Multipurpose Area	Multipurpose Hall	Open Kitchen	Partitioned Sleeping Area	Room	Stair Well	Storage	Terrace	Verandah	W.C.
12h	8	7u	•		•	•					•			•	•	
		1g					•									
12c	12	6u	•		•			•			•					
		6g				•		•			•					••
13h	7	6u			•	•					•			•	•	
		1g					•									
13c	14	7u						•			••	•				•
		7g					•		•		••	•				•
14h	9	8u			•	•	•	•			••			•	•	
		1g														
14c	10	9u	•		•			•	•		•••					•
		1g					•									
15h	8	7u			•	•					••			•	•	
		1g					•									
15c	12	4u	•					•			•					
		8g						••	•		•		•			•
mh1	8	7u			•	•					••			•	•	
		1g					•									
mh2	11	10u	•	•	•	•					••			•	••	
		1g					•									

***Appendix E:***  
***Additional Information on master house builders***

## **The past and present of traditional house building**

In the past 50 years, house buildings practices in Central Thailand have been changing from the combination of community collaboration and hiring of a local craftsman to a total commercial enterprise. Knowledge transfer system for house building has been shifting from the master-apprentice to hiring system. Due to the limited room for career growth, elderly master builders note that pool of the carpenter entering the workshop to receive training has been significantly decreased.

Today's the process and duration for the building of the traditional Thai house has also been altered. According to the interview accounts, many younger generation of builders and carpenters admit that they are no longer knowledgeable about the spirit religion ritual involve in the selection of building material or site selection. Some superstitious practice such as relating numerology belief to the preference for certain house dimension is still being performed, but it is not unusual that the performer no longer understand the meaning of the practice anymore (Barrett, 1991).

The builders of the traditional Thai house have passed on the knowledge pertaining to the construction techniques, geographical and climatic condition, and house building ritual through generations of men from the same village via the master and apprentice system.

Thai vernacular architecture scholars (Chaichongrak, 1979; Pongmethakul, 2002) believe that the aforementioned intricate knowledge has been passed through generations of rice farmers/builders through the Spirit religion particular prescriptions involving selection of the proper materials, site, as well performing the construction ritual, and the belief about the relationship between dimension of the house (numerology) and the prosperity of the dwellers (Chichongrak et al., 2002).

The construction process of the traditional Thai house may be divided into two parts major parts. These parts are "Prung Reun" (fabrication the house parts) and "Plook Ruen" (construction the house). The Thai terms used in describing these two phases are semantically interesting. The actual word "Prung" means 'to cook' or 'to assemble' something delicate, is normally used in culinary context. This term infers that the delicate fabrication process of the house requires care and attention to details. The word "Plook" from the second phase reasonably means 'to plant,' which is in someway

correspond with Devakula's (2000) tree analogy for an experiential quality of the traditional Thai home. This second process involves putting the house structure into the ground (and hope it will take root), and also the process of assembling the prefabricate parts to make a dwelling unit (grow).

The dwelling unit of the traditional Thai house can be described as a composition of several knockdown components. The major components are composed of 1) roof structure components, 2) wall panels, and 3) columns. Each of the components requires different type of carpentry techniques. The apprentices would learn how construct the components one by one. Once an individual acquires the carpentry technique to construct every part, and know how to assemble all of the pieces together, they could become a master builder if they have enough funding to establish their own workshop.

Historically, the builders of the traditional Thai house were actually farmers that doubled as craftsmen during after the harvest seasons.



**Figure 105: One of the elderly master builders in front of his workshop**





**Figure 106: The atmosphere within one of the builder's workshop**

The unsystematic learning through master-apprentice arrangement couple with the prejudice between the master and certain apprentices have made the knowledge transfer for traditional Thai house building become a very long and tedious process.

All master builders agree that it is not uncommon for an individual carpenter to remain a beginner for several years in order to master the construction skill for every parts of the dwelling components. This lengthy knowledge transfer system such as this was no longer appropriate in today's condition where the apprentice, without an alternative career as a farmer, only hold one job as a carpenter. This has resulted in the diminishing of master builders and carpenter with expertise in traditional Thai house building all over Thailand.

## **Bibliography**

- 34 Years of Land Reform for Thailand's Agricultural Development. (2009, January 27, 2009). *Matichon*, p. 1.
- 2003, T. M. South-East Asia Atlas. Retrieved March 27, 2009, from <http://www.world-maps.co.uk/continent-map-of-south-east-asia.htm>
- Akiyama, T., & Larson, D. F. (2004). *Rural development and agricultural growth in Indonesia, the Philippines and Thailand*. Canberra: Asia Pacific Press, Asia Pacific School of Economics and Government, Australian National University.
- Alexander, J., Fox, J. J., Helliwell, C., Meijl, T. V., Ng, C., Sather, C., et al. (2007, 2007). *Inside Austronesian Houses: Perspective on Domestic Design for Living*. Retrieved March 26, 2009, from [http://epress.anu.edu.au/austronesians/inside/mobile\\_devices/](http://epress.anu.edu.au/austronesians/inside/mobile_devices/)
- Amyot, J. (1994 ). *The structure of employment of the rural population of the central region of Thailand : source - the 1990 village survey of the National Rural Development Committee of Thailand (Kor Chor Chor 2 Khor)*. Bangkok [Thailand]: Chulalongkonmahawitthayalai. & National Rural Development Committee of Thailand, Chulalongkorn University Social Research Institute.
- Amyot, J., & Fuhs, F. W. (1976). *Village Ayutthaya : social and economic conditions of a rural population in central Thailand* Bangkok [Thailand]: Chulalongkorn University, Social Science Research Institute.
- Ando, H., Ness, G. D., Yadav, X., Talwar, P., Chowdhury, I., Wongthanavas, S., et al. (2008). *Aging in Asian Cities: An Exploratory Analysis. Experience of the Asian Urban Information Center of Kobe And Its Associate Cities (AACs)*.
- Bafna, S. (2001). *A morphology of intentions: The historical interpretation of Mies van der Rohe's residential designs (Ludwig Mies van der Rohe)*. Georgia Institute of Technology.
- Baker, A. (2002). *The Schuylkill River Public Art Process: An Ethnographic Focus on a Philadelphia Urban Park's Development*. University of Temple.
- Bell, P. A. (2006). *Environmental psychology*. Mahwah NJ [etc.]: Erlbaum.
- Blaikie, N. (2000). *Designing Social Research: The Logic of Anticipation*. Cambridge: Polity Press.
- Brereton, B. (2006). Mural painting from Isan. In [img\\_0077.jpg](#) (Ed.). Northeastern Thailand.
- Brunskill, R. W., & Brunskill, R. W. (2000). *Vernacular architecture: An illustrated handbook*. London: Faber.
- Canter, D. (Ed.). (1997). *The Facet of Places* (Vol. 4). New York, NY.: Plenum Press.
- Carsten, J. (1995). Houses in Langkawi: Stable Structures of Mobile Homes? In J. C. a. S. Hugh-Jones (Ed.), *About the house : Levi-Strauss and beyond* (pp. 105-128). Cambridge; New York: Cambridge University Press.
- Carsten, J., & Hugh-Jones, S. (1995). *About the house : Levi-Strauss and beyond*. Cambridge; New York: Cambridge University Press.
- Certeau, M. d. (1988). *The practice of everyday life*. Berkeley: University of California Press.
- Chaichongrak, R. (1979). *The Traditional Thai House (in Thai)*. Bangkok: Private Limited Edition.
- Chaichongrak, R. (1996). *Traditional Thai House*. Bangkok: Thammasat University Press.

- Chaichongrak, R., Nil-athi, S., Panin, O., and Posayanonda, S. (2002). *The Thai House: History and Evolution*. Bangkok: River Books.
- Changnoi. High Rice Prices, CP-nomics and the Future of the Farmer. *Thailand Monitor* Retrieved April 7, 2009
- Chantavilasvong, S. (1987). *The Spirit Cults and Superstition in Thai Habitation: A Case Study in the Northern Region*. Unpublished Book, University of Michigan, Ann Arbor, Michiga.
- Charernsupkul, A., & Temiyabandha, W. (1978). *Northern Thai Domestic Architecture and Rituals in House Buildings*. Bangkok: Association of Siamese Architects under Royal patronage.
- Cholitkul, V. (2007). *30 Years of Agricultural Land Reform Office in Retrospect*. Bangkok, Thailand.
- Chulasai, B. (Ed.). (1997). *Thai House*. Bangkok: Chulalongkorn University Press.
- Cooper Marcus, C. (1997). *House as a Mirror of Self: Exploring the Deeper Meaning of Home*. Berkeley, CA: Conari Press.
- Coutsoukis, P. (2004). from [http://www.photius.com/countries/thailand/economy/thailand\\_economy\\_agriculture.html](http://www.photius.com/countries/thailand/economy/thailand_economy_agriculture.html)
- Cresswell, J. W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (2nd Edition)*. Thousand Oaks, CA: Sage Publication.
- Csikszentmihalyi, M., & Rochberg-Halton, E. . (1981). The Home as Symbolic Environment, Characteristics of Happy Homes. In *In The Meaning of Things* (pp. 121-145, 146-171). Cambridge: Cambridge University Press.
- Cuisenier, J. (1991). *La maison rustique logique sociale et composition architecturale*. Paris: Presses Univ. de France.
- Davies, M. (2002). *Introducing Anthropology*. London: Icon Books.
- Debavalya, N. (1981). Patterns of fertility decline in Asia: with a special reference to the case of Thailand. *Journal of Thai Association of Voluntarily Sterilization*, 3, 47-56.
- Despres, C. (1991b). The Meaning of Home: Literature Review and Directions for Future Research and Theoretical Development. *Journal of Architectural and Planning Research*, 8(2), 96-114.
- Devakula, P. (1999). *A Tradition Rediscovered: Toward an Understanding of Experiential Characteristics and Meaning of the Traditional Thai House*. University of Michigan, Ann Arbor.
- Devakula, P. (2000, June 22-23, 2000). *On Aesthetic and Space in the Traditional Thai House--A Cultural Dimension*. Paper presented at the Diversity of Thai Vernacular Houses, Silpakorn University.
- Duangwiset, N. (1996). *Dwellings of the Central Thai farmers in the history: A case study of Lao village, Plai-klad subdistrict, Bang-Say district, Ayutthaya province.*, Thammasat University, Bangkok.
- Durkheim, E., & Swain, J. W. (1976). *The elementary forms of the religious life*. London: Allen & Unwin.
- Extension, D. o. A. T. (2008). *Database for Agricultural Technology for Baan Krang, Si Prachan*. Retrieved. from <http://agtech.doae.go.th/dbdisplay/3.php>.

- Feeny, D. (1982). *The political economy of productivity : Thai agricultural development, 1880-1975*. Vancouver: University of British Columbia Press.
- Flanders, J. (2004). *Inside the Victorian home : a portrait of domestic life in Victorian England* (1st American ed.). New York: W.W. Norton.
- Freire, P. (2004). *Pedagogy of the oppressed*. New York: Continuum.
- Geertz, C. (1993). *Local Knowledge*: Basic Books.
- Ginsburg, H. (1989). *Thai Manuscript Painting*. London, UK: The British Library.
- Gladwell, M. (2008). *Outliers : the story of success*. New York: Little, Brown and Co.
- Gombrich, E. H. (2005). *Art and illusion : a study in the psychology of pictorial representation*. London; New York, NY: Phaidon.
- Groat, L. (2005). *Canter's Model of Place: It's Enduring Value for Teaching and Research*. Unpublished manuscript, Ann Arbor, Michigan.
- Groat, L., & Wang, D. (2002). Qualitative Research, Case Studies and Combined Strategies. In L. G. D. Wang (Ed.), *Architectural Research Methods* (pp. 173-202, 341-373). New York: John Wiley & Sons.
- Groat, L. N. (2000). A Conceptual Framework for Understanding the Designer's Role: Technician, Artist or Cultivator? In P. K. a. P. Ozolins (Ed.), *Design Professionals and the Built Environment* (pp. 41-51). New York: John Wiley & Sons Inc.
- Groat, L. N., & Wang, D. (2002). *Architectural research methods*. New York: J. Wiley.
- Income Growth and Poverty Alleviation*. (1980.). Washington D.C: International Bank for Reconstruction and Development.
- Krongkaew, M. (1985). Agricultural Development, Rural Poverty, and Income Distribution in Thailand. *The Developing Economies, XXIII-4*, 22.
- Kuysorn, W. (2006). Personal communication. Bangkok, Thailand.
- Land Cover Assessment of 1992/93. Retrieved April 7, 2009, from <http://www.rrcap.unep.org/lc/cd/html/countryrep/thailand/results.html>
- Lara, F. L. (2001). *Popular modernism: An analysis of the acceptance of modern architecture in 1950s Brazil*. University of Michigan, Ann Arbor.
- Lawrence, D., & Low, S. (1990). The Built Environment and Spatial Form. *Annual Reviews In Anthropology, 19*, 453-505.
- Lawrence, R. J. (1987). *Housing, Dwelling, and Homes: Design Theory, Research and Practice*. Chichester: Wiley.
- Lawrence, R. J. (2000). House Form and Culture: What Have We Learnt in Thirty Years? In K. D. Moore (Ed.), *Culture-- Meaning-- Architecture: Critical Reflections on the Work of Amos Rapoport* (pp. 37-52). Aldershot: Ashgate.
- Leach, E. (Ed.). (1968). *Introduction in Dialectic of Practical Religion*. Cambridge: Cambridge University Press.
- Leach, N. (Ed.). (1997). *Rethinking Architecture: A Reader in Cultural Theory*. London: Routledge.
- LePoer, B. L. (1987). Thailand. *Country Studies Series* Retrieved April 3, 2009, from <http://www.country-data.com/>
- Levi-Strauss, C. (1982). *The way of the masks*. Seattle: University of Washington Press.
- Loizos, P. (2000). Video, Films and Photographs as Research Documents. In M. W. B. G. Gaskell (Ed.), *Qualitative Researching with Text, Image and Sound: A Practical Handbook* (pp. 93-107). London: Sage Publication.

- Mathison, S. (1988). Why Triangulate? *Educational Researcher*, 17(2), 13-17.
- McKinnon, S., & Hugh-Jones, S. (1995). Houses and Hierarchy: the View from a South Molucan Society. In J. C. a. S. Hugh-Jones (Ed.), *About the house : Levi-Strauss and beyond*. Cambridge; New York: Cambridge University Press.
- Milner, A., & Browitt, J. (2002). *Contemporary cultural theory*. Crows Nest, N.S.W.: Allen & Unwin.
- Nawikamune, A. (2001). *Pictures of the Old Siam 1-2-3*. Bangkok: Nohrah Publisher.
- Nevett, L. (1997). Separation or Seclusion? Toward an Archeological Approach to Investigating Women in the Greek Household in the Fifth to Third CenturiesBC. In M. P. P. a. C. Richards (Ed.), *Architecture & Order: Approaches to Social Space* (pp. 98-112). London: Routledge.
- Nisbett, R. E. (2003). *The Geography of Thought: How Asians and Westerners Think Differently...and Why*. New York: Free Press.
- Nupan, A., Chantarachote, P., Chantavich, N., Insherdshai, C., Kaongern, P., Chantamala, N., et al. (2003). *National Museum of Suphanburi*. Bangkok, Thailand: Office of the National Museum, Department of Arts, Ministry of Culture.
- O'Brien, D. (2004). Eurocentrism: Do Thai and Australian Housing Developers Have a Case to Answer? *Journal of the Faculty of Architecture Silpakorn University*, 20, 130-138.
- Oliver, P. (1997). *Encyclopedia of the vernacular architecture of the world*. New York: Cambridge University Press.
- Orhun, D., Hillier, B., & Hanson, J. (1995). Spatial types in traditional Turkish houses. *Environment and Planning B*, 22, 475 - 498.
- Palayasoot, P. (2007, April 7, 2009). *The Evolution of Irrigation and Rice Growing Production in Thailand*. Paper presented at the the 4th INWEPF meeting.
- Panin, O. (1998-1999). Thai-Mon Vernacular Houses. *Journal of the Faculty of Architecture Silpakorn University*, 16.
- Pearson, M. P., & Richards, C. (1997). Ordering the World: Perception of Architecture, Space and Time. In M. P. a. C. Richards (Ed.), *Architecture & Order: Approaches to Social Space* (pp. 1-37). London: Routledge.
- Pearson, M. P. R., Colin. (1997). Preface. In M. P. P. C. Richards (Ed.), *Rethinking Architecture: A Reader in Cultural Theory* (pp. 409). London: Routledge.
- Peranonda, P. (Ed.). (1982). *Thai Vernacular Architecture*. Bangkok: Faculty of Architecture, King Mongkut Institute of Technology Ladkrabang (KMITL).
- Plimpton, C. L., & Hassan, F. A. (1987). Social space: a determinant of house architecture. *Environment and Planning B*, 14, 439 - 449.
- Pongmethakul, A., Plaichumbhol, C., and Tongarun, N. (2002). *Ayuthaya Craftmanship: The Belief and Procedure to Create Central Region Thai House*. Retrieved. from.
- Rapoport, A. (1969). *House Form and Culture*. Englewood Cliff: Prentice-Hall.
- Rapoport, A. (2000). Culture and Built Form -- A Reconsideration. In K. D. Moore (Ed.), *Culture-- Meaning-- Architecture: Critical Reflections on the Work of Amos Rapoport* (pp. 175-216). Aldershot: Ashgate.
- Robey, D. (1973). *Structuralism : an introduction*. Oxford: Clarendon Press.

- Rossmann, G. B. B. L. W. (1985). Numbers and Words: Combining Quantitative and Qualitative Methods in a Single Large-Scale Evaluation Study. *Evaluation Research*, 9(5), 627-643.
- Rubbo, A. (1979). *Housing as a Medium of Cultural and Political Changes*. Unpublished Qualitative, University of Michigan, Ann Arbor.
- Rykwert, J. (1982). Meaning and Building (reprinted). *Zodiac* 6(Academy Editions), 9-16.
- Shalvey, T. (1979). *Claude Levi-Strauss: Social Psychotherapy and the Collective Unconscious*. University of Massachusetts Press. Amherst, MA. .
- Shigetomi, S. (2004). Thailand's Rural Sector and the Government. In T. A. D. F. Larson (Ed.), *Rural development and agricultural growth in Indonesia, the Philippines and Thailand*. Canberra, Australia: Asia Pacific Press, Asia Pacific School of Economics and Government, Australian National University.
- Sparkes, S. (2005). *Spirits and Souls : Gender and Cosmology in an Isan Village in Northeast Thailand*. Bangkok White Lotus Co., 2005.
- Sparkes, S., & Howell, S. (2003). *The house in Southeast Asia : a changing social, economic and political domain*. London; New York: RoutledgeCurzon.
- Spiro, M. E. (Ed.). (1967). *The Physical Function of Witchcraft Belief: The Burmese Case*. Honolulu: East-West Center Press.
- Tambiah, S. J. (1976). *Buddhism and Spirit Cults of North East Thailand*. Cambridge: Cambridge University Press.
- Temiyabhandha, W. (2006). Personal communication. Bangkok, Thailand.
- Terweil, B. J. (1994). *Monks and Magic: An Analysis of Religious Ceremonies in Central Thailand* (Third Revised Edition ed.). Bangkok, Thailand: White Lotus Press.
- Terwiel, B. J. (1980). Leasing from the Gods (Thailand). *Anthropos*, 71, 254-274. *Thailand: Program and Policy Priorities for an Agricultural Economy in Transition*. (1982).). Washington D.C.: International Bank for Reconstruction and Development.
- Thippathat, P. (2002 ). *Bān nai Krung Rattanakōsin*. Bangkok: Array Krung Thēp: Rōngphim hag Čhulālongkōn mahāwitthayālai.
- Waterson, R. (1991). *The Living House: An Anthropology of Architecture in South-East Asia*. New York: Oxford University Press.
- Waterson, R. (1995). Houses and Hierarchies in Island Southeast Asia. In J. C. a. S. Hugh-Jones (Ed.), *About the house : Levi-Strauss and beyond* (pp. 47-68). Cambridge; New York: Cambridge University Press.
- Wattanuchariya, S., & Jitsaguan, T. (1992-2001). Increasing the Scale of Small-Farm Operation I.Thailand. Retrieved April 7, 2009, from <http://www.agnet.org/library/eb/344a/>
- Wongthet, P. (2006). *Gender in Southeast Asia*. Bangkok: Matichon Book.
- Wyatt, D. K. (2004). *Reading Thai Murals*. Chiangmai, Thailand: Silkworm Books.
- Yimsrual, S. (2007). Thai Dwelling Place: A Reference to Auspicious Domain. Faculty of Architectural Studies, The University of Sheffield, UK.
- Zeisel, J. (2006). *Inquiry by design: environment/behavior/neuroscience in architecture, interiors, landscape, and planning*. New York: W.W. Norton & Company.