The Living Culture and Typo-Morphology of
Vernacular-Traditional Houses in Kerala

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Introduction

The term "vernacular architecture" stands for the art of constructing buildings and shelters which is spontaneous, environment-oriented, community-based; it acknowledges no architect or treaty and reflects the technology and culture of the indigenous society and environment (Rudofsky 1964: 4). Vernacular architecture is the opposite of high traditional architecture which belongs to the grand tradition (e.g. palace, fortress, villa, etc.) and requires special skills and expertise which an architect must have knowledge of and for which he enjoys a special position (Rapoport 1969). This paper is a chronicle of observations of traditional vernacular houses in the whole region of Kerala done within nine months The research methods used include observation and photography-documentation of more than 50 traditional-vernacular houses in Kerala State and 30 more random places in other states for comparison. Experts and builders were also interviewed. The object of study is to find patterns and sources of settlement, buildings, living cultures and local indigenous knowledge. Location of samples are in the districts of Shoranur, Pattambi, Pallipuram, Calicut, Palghat, Aranmula, Chenganur, Tiruvalla, Kottayam, Ernakulam-Cochin, Tripunitura, Perumbavur, Mulanthuruti, Piravom, Trivandrum, Kanyakumari, Attapadi, and Parapanangadi. From these places, 52 samples of traditional-vernacular residential architecture of Kerala were observed. These samples cover ordinary commoner houses, the traditional courtyard house and the single mass house, as well as the non-Kerala vernacular houses and houses with colonial vernacular architecture.

The research method utilized is the *Typo-morphology* analysis (Argan 1965, Moneo 1978) which examines existing types of residential houses and their complementary. Typo-morphology mapping has been done to identify all possible factors that espouse the conceptualization of forms and space of the houses. Using *Vernacular Matrix* (Papanek 1995), the analytic categorization of types would be cross-checked with other aspects such as culture, history, social, geography to acknowledge driving forces which are embedded in the formation of Kerala's traditional-vernacular houses and living culture.

Conceptual Framework

The diversity of nature and culture in India has made it impossible to define Indian pre-modern and early modern architecture as a single solid cultural entity. However, due to similarities in climate, it is natural that the environmental characteristics of Kerala are more comparable with those of Southeast Asia than with the rest of the Indian subcontinent. Pre-modern architecture in Kerala and also possibly in other regions of deep South Asia (Srilanka, Maldives, islands in the Sea of Bengal) must have shared common traditions with Southeast Asian architecture, which is wet tropical architecture.

Because the Western Ghatz isolated Kerala from the rest of the subcontinent, the infusion of Aryan culture into Kerala was very recent. It came only after Kerala had already developed an independent culture, which can be as early as 1000 B.C. (Logan 1887). The Aryan immigration is believed to have started towards the end of the first millenium. Christianity reached Kerala around 52 A.D. through the apostle Thomas. The Jews in Kerala were once an affluent trading community on the Malabar. The first mosque in India was built in Kerala when a Travancore king converted to Islam around the 8th century, coinciding with the dawn of Islam/ Mohammedanism in the Middle East. The coming of European traders not only introduced new vocabulary to the existing traditions, but it also promoted relations with Southeast Asia. Therefore, it is seemingly obvious that subtle eclecticism had been the nature of Kerala artistic value, in which all kinds of influences, including Brahmanism, contributed to the cultural diffusion and architectural tradition. More homogeneous artistic development may have rigorously occurred around the 8th century as a result of large-scale colonization by the Vedic Brahmans, which caused the decline of Jainism and Buddhism (Menon, 1978; in Singh 2002).

Historically, Kerala was a participant in the dynamic trading web of the Mediterranean, South Asia, Southeast Asia and China since the 13th century or even earlier, hence its towns such as Calicut, Cochin, Quilon, Beypore and Crangganore are known to be important old international seaboards. Most of the writings on the cultural formation of Kerala, which mostly referred to Indian, British and French sources (Logan, 1887; Menon, 1911; Singh, 2003), tended to relate Kerala's historical narratives and foreign influences only with western cultures, such as Persian, Roman, Greek, Jewish, Arabic and other Mediterranean and West Indian civilizations. William Logan (1887), in the *Malabar Manual* reported contacts only with the Chinese around 145 A.D., but did not further explain how the contact with countries in between were initiated. Admiral Zheng from the Ming dynasty was reported boarding from China to Srilanka and Calicut, as well as to Indonesia, Malaka and Assam around 1555 for trade. Chinese influences in domestic life are also obvious in some names of domestic utensils, such as *cheena chatti* (cooking utensils made of cast iron), *cheena bharani* (big jar made of china clay, introduced by Chinese), all suggesting the occurrence of cultural exchange between Kerala and China.

I have personally seen an old sketch in Kerala's Museum entitled "Chinese market" which was obviously a picture of the Surakarta Palace in Java. This shows that cultural indebtedness of Kerala to China and Southeast Asia has not been thoroughly researched, as the indebtedness of Southeast Asia to India as in the work of Coedes (1963).

On the other hand, some evidence has confirmed that the vocabulary of Kerala domestic architecture has inevitably shared basic form with that of Southeast Asia. Bruno Dagens (1994) suggested that South Indian architecture partially inherited *Pre-Angkorean* influences. In the translation of *Mayamatam[i]*, Dagen took Kerala's architectural construction and design plan to study the South Indian design. Records of houses found in temple relief depicting villages of Majapahit at Sukuh temple (10th–11th century A.D.) East Java, and Dongson's drum in Vietnam show their resemblance to typical current and surviving traditional-vernacular roof-houses in Kerala. The ornaments in the window grills found in many places in Kerala's houses are very similar to those petrified window and doors of the *Bantey Srei* temple of Cambodia. The bent-roof, which has been archetypical in the Southeast Asian house since ancient times, is also found in Kerala. Kerala's door locks are also similar to those used in Javanese and Sumatran houses. The Sree Padmanabhapuram palace exhibits the eclectic mix of Chinese, Southeast Asian, Indian and European styles. These brief and early references demonstrate the contemporaneity of Kerala traditional-vernacular houses with the traditional-vernacular houses from her eastward world.

The Kerala Traditional Dwelling Culture

Kerala is a state of India in the southernmost tip of the subcontinent which shares environmental characteristics with Malaya and the Pacific archipelago, such as a wet tropical climate with an average temperature of 25^0C-28^0C. Kerala is popularly called Malabar which means land between Mountain – *Ma* (*Sanskrit*) - and Sea- *Bar (Arab)*. The mountain ranges block the Northeastern wind that flows from the Arabian Sea to mainland India. There is frequent rainfall on the state but the opposite region – Tamil Nadu – is a dry, shadowed, rainless plain. Between the mountains and the sea is a strip of fertile midland blessed with high rainfall and rich biodiversity that is conducive to a wet agriculture living culture. Here, units of culture that depend on rivers were developed and constituted the agricultural community. Each social unit became a principality that resulted in a feudal organization. A matrilineal culture developed due to perpetual conflicts among the various groups. Paddy cultivation was largely undertaken alongside the riverbanks by the expanding Brahman settlements in Kerala. Necessary labor was taken from inferior castes. In the old days, a Brahmin family could occupy land as much as 6000 acres, where they can set up their sole courtyard house (*Nalukettu* -Malayalam*)*. The nature of midland economy favors the emergence of isolated communities, each limited to a minor watershed defined by the buttresses of the ghats and small rivers. This is the reason why Kerala midland settlements do not reflect a strong urban culture akin to the typical concentric geometrical arrangements and line house-street formation characteristic of a Tamil settlement

(Logan, 1887). They are mostly scattered individual houses or mansion compounds standing upon a breadth of paddy landscape, a village with a "gardenlike landscape"-- *ekakudumbaka-gramam-* (Thampuran, 2001). It is difficult to find where a village or town begins and ends because houses are spread out.

In selecting the exact spot for this kind of dwelling, a *Malayali* (people of Kerala) is guided by a simple rule. The garden in which the house is to be placed must be intersected into equal portions by lines running due north and south and due east and west. Four divisions of the plot are thus formed. The *padinyatta-pura* (*padinjatini*/ western hall) is to be placed in the northeast division of the plot, coinciding with the inner corner or southwest angle of the division (Singh, 2003: 84). This midlands agriculturist living culture has become the model environment of Kerala. Here, most of the popular representations of domestic architecture such as the *nalukettu* can be found.

Geometrical arrangements for settlement were just recently used in royal compounds and temples, yet these are set in the middle of overwhelming rural greeneries and near a major river. The Sree Padmanabhapuram palace, the Sree Valabha temples, the Sree Padmanabhaswamy temple, the Pandalam palace, and the Tripunitura royal compound show typical geometrical and dense compositions, familiar to classical and regional treatises. This is expected since Kerala's royal community inherited the royal tradition of the Dravidian *Tamilakam*.

Yet there are many other regions where a diversity of vernacular huts occurs, even though these are not as grand as that of the midlander. The high ranges are home to the earliest population who were either indigenous inhabitants or settlers who moved there to escape the incursion of later immigrants. The inaccessible habitats sustained their culture for long time. Waynad and Attapadi are places in the hilly area of North Kerala dotted with unique folk settlements, mostly belonging to the Irrulla tribe (*adivasi*). The structures of the settlement are typically arrays of single nuclear family houses, standing in rows that go to the general direction of a river or sea. Behind the houses are hills or higher land. Between the settlements near the riverbank and the hilly areas are their cultivated fields or working plains where villagers take their cows to graze or where fishermen prepare their boat and fishing equipment. These people are possibly remnants of the Proto-Austroloid which once inhabited Pre-Dravidian lands[ii]. The structural arrangements of communal institutions are not hierarchically governed by royalty or priest, but organized by members of representative councils consisting of a prime chieftain (*Oorumoopan*), secretary (*Kuruthalada*), logistic officer (*Bandhari),* and seed manager (*Manukaran*). Accordingly, the *valiyaveedu* (Community hall) was once an important institutional building that hosted the communal assembly. This kind of institution is comparable to what is found in traditional villages in Malaya and Indonesia.

Along the coast, the scene was entirely different. The product of Kerala domestic cultivation attracted trade from far away land. Foreign influences in religion, language and art

forms shaped the culture. The economy of the coastal life shows a different pattern. They are more conglomerative and interdependent than the rest of Kerala. International trade contacts centered on natural ports and anchorages around which sprang towns where the headquarters of governments are located.

Kerala is known to have only three castes, it does not have the *Veicya* caste. Yet this idea seemed to be based on the narrations of Hindu agriculture tradition as a predominating living culture[iii]. These narrations did not consider the immense development of the coastal area which was developed by traders whose lives depended on maritime trading and fishing. They roamed the coast and the backwater and river canals. Yet usually these people belong to a non-Hindu Malayali or foreign culture, such as Gujarati, Kongkani, Jewish, and Arab. Some of their settlements took alien forms different from the Kerala type, such as those found in Cochin[iv] and Matancheri, Central Kerala. In the Thazhatangadi Theruvu district of Kottayam there is a traditional strip of canal-settlement with a couple of rows of traditional-vernacular houses facing the Meenachil River and the boulevard flanking both sides of the river. These strips mostly belong to traders and merchants who are Muslim and Christian Syrian. The house types are popularly considered Christian Syrian and perform the eclectic vocabulary of the Kerala, Southeast Asian, and Portuguese styles. The seashore settlements, especially those around the ancient trading ports, show the most extreme eclectic features compared to those in inland Kerala.

Types of Houses: *Veedu*

A house in Kerala is generally called *Veedu*. The *Veedu* gives shelter to joint-family kinfolk or *tharavad*. The joint family system (*tharavad*--kinship system) consequently promotes the tradition of living in a huge shelter or mansion *(veedu*--object of house*)*. The term is Dravidian and is used in some parts of Tamil Nadu and North Srilanka for all types of residential architecture, but generally the people of Kerala will refer to their *veedu* as *tharavad*. However, domestic architecture in Kerala is diverse. Particularly, tribal people have more ways of referring to houses or huts according to locality, social status and structural types. Observations on the proper traditional-vernacular house generated five types of spatial house structures.

Although v*eedu* is a very common vernacular term for house among the tribal communities, there are actually various terms of house for different tribes according to social status and profession. The house of *Pariah* is called *cheri*, while the agrestic slave—*Cheraman*--lives in a *chala*. The blacksmith, the goldsmith, the carpenter, the weaver and the toddy drawer inhabit a house called *kudi*; temple servants reside in a *variyam* or *pisharam* or *pumatham*. The ordinary Nayars stay in a *Vidu*/ *Veedu* or *bhavanam*, while the Nayar's authority dwell in an *idam*. The Raja lives in a *kovilakam* or *kottaram*. The indigeneous Brahman (Nambutiri) resides

in an *illam*, while his fellow of higher rank calls his house a *mana* or *manakkal* (Iyer 1968 in Singh, 2003).

There are various types of residential structures for different tribes (Iyer 1968 in Singh, 2003). Cave dwellings were found among the *Cholanaickan* tribe. Each house of a nuclear family was demarcated by hearth. Lake dwellings and three huts in the surrounding backwater were also found to be plentiful. Forest dwelling people tend to settle in hamlets comprised of closely related individuals, each of them preferring an individual homestead.

There are five types of traditional domestic architecture or *Veedu* in Kerala, namely: (1) the wretched humble house, unknown by any building treatise of Kerala, belongs to ordinary folks and tribal people/ *adivasis* (*cheri*, *chala*, *kudi*, *variyam* or *pisharam* or *pumatham*); (2) the *Ekasala*, an I-shaped single rectangular hall house, belongs to farmers or middle-class non-farmers; (3) the *Nalukettu,* a courtyard house, belongs to landlords; (4) the great mansion *Ettuketu* and *Patinjarukettu* (double *ettukettu*) or much bigger structures, belong to very rich landlords; (5) commoner houses are simple ordinary houses scattered abundantly in the cities and villages. They still show applications of traditional construction and vocabulary in an eclectic, popular and free manner.

Literally, the local term of house--*veedu*--means home and signifies no important structural arrangement. Classical Indian architecture acknowledges a concentric arrangement of buildings and a generic spatial structure of the *sala* or hall. The *Ekasala* is a single hall house, *dvisala* a two-hall house, *trisala* a three-hall house, and *catusala* a four-hall house/courtyard house. The *Nalukettu* is the only local term for house that implies structural importance since it is associated with the *catusala*. There are no local terms for *dvisala, trisala* and *ekasala*, they are simply called *veedu*. A Muslim house or a Christian Syrian house is also simply called *veedu*, even though it is a big mansion with a courtyard. Most probably, the importance of the development of a *nalukettu* refers to the traditional-classical treatise; while the indigenous-vernacular development of houses/ *veedu* does not necessarily refer to it. The fact that there are more I-shaped single *veedu* than *nalukettu* as observed by Thampuran (2001) may explain the greater degree of its vernacular aspect. This may explain why the single hall house/ *veedu* is general and generic.

Like most houses in Southeast Asia, the spatial and functional aspects of domestic activity and spaces are housed in the different halls or spaces, not rooms. In the tribal compounds, the fireplace or cooking and washing areas are in separate halls or corners. The compound exhibits the purpose of the different functional halls and exterior living. The same pattern is also seen in the middle-class ekasala *veedu*, where the kitchen would be always placed separately but at times connected to other parts of the house by porticos. Forest dwelling tribes like the Muthuvan and Urali Kuruman always have a *Valiyaveedu* (community hall). Community

halls in Southeast Asian architecture are very essential in performing democratic and communal governance.

The Single Hall House

The generally house structure in Kerala is that of the single hall house. Only later will this single hall be partitioned to have interior divisions. Wretched huts and hamlets are mostly individual small huts consisting of only one hall divided into inner and living spaces by means of temporary structural dividers. The one single hall house is also still found among the dwellings of the higher classes such as the *Amma Veedu* in the royal compound of East Fort, Trivandrum.

Single hall huts can still be found in interior villages, seashore villages and even in the vernacular houses in the city. The houses are usually small and are erected on ground level, sometimes on a raised platform. The materials are locally available: bamboo reeds, wooden poles, mud and local grass or leaves. The walls may be made of wattle (bamboo splints woven together and covered with a mud plaster) and are sometimes decorated with red or white mud stripes. The door is protected by a sliding screen made of plaited bamboo. The roof is made of wooden poles, bamboo and reed, and is thatched with grass. Rounded or pyramidal-shaped roofing is also constructed occasionally for the traditional Kullu and Kuruman huts and the Kurumba Pulaya for *Thennesveedu* or menstrual hut. Their settlement always appears as clusters of houses standing in rows facing water sources (river, lake, backwater, and ocean) and behind would be the mainland or a mountain. Huts are somehow still available in the city, regardless of social status, thus marking the availability and practicality of its construction. In south Kerala, huts are unique for their bent roof shapes.

The spatial division found in both huts and the more elaborate middle class single mass house basically originates from the one hall house. The hall can be arrayed and constituted into a row of halls for different functional spaces linked by a veranda, or divided into arrayed inner rooms. It seems that the three arrayed rooms is the most frequent spatial structure that appear in single hall houses. The rectangular single hall, with a sitting platform attached, is made of laterite stones or hardened mud, plastered with a mixture of mud and cow dung. Superstructures are made of wood planks. Later, additional space was added to the three arrayed rooms in the form of an additional gallery that run behind the rooms, thus imaging 9x9 spatial grids. Three arrayed rooms and 9x9 spatial grids are becoming archetypical in the spatial partitioning and division of the single hall. They have become a schema for the traditional-vernacular structure used in commoner houses.

Ekasala*/ Structure of the Farmer's House*

As farming is the major means of livelihood in Kerala, the grain store has become an important structure to maintain. Grain store designs vary from a small box (*pattayam*), to a house grain storeroom (*ara*) and a house for grain storage with a treasury building (*pattayapura/ pathayapura*).

The agriculturist or *ekasala* house has a typical single hall partitioned into three arrayed rooms, enriched or fronted by a gallery/veranda. The middle room is thus regarded the most important part which is utilized as *ara. Ara* is a 4-5 feet platform. *Ara* or the grain store is becoming the very soul of the house since it is put in the middle room, and is considered sacred. The two other rooms flanking *ara* are called *Kalavara*. The structure of three-room-arrays and the *kalavara-ara-kalavara* prevails in villages and cities. The rooms are multifunctional and could be used as bedroom, storage or treasury. Beneath the *Ara,* there is a semi basement storage room called *nilavara.*

The *Ara* has two doors. One faces the interior and is for daily use while the other side faces the exterior or rare gallery / passageway to get the paddy in. In any house arrangement, the *ara-kalavara* would be put in either the western quarter (*padinjatini*) or the southern quarter (*thekkini).* The door of *Ara* opens to the east while that of *nilavara* (semi-basement storage) opens to the west. The typical structure of an *ara* is that it is flanked by two *kalavara* and there is a *nilavara* beneath; this is becoming the typical basic package of a peasant's house. In the morphology of the *nalukettu*, the *ekasala* is positioned in one quarter of the fourfold hall, usually in the western quarter or *padinjatini* or the southern quarter or *thekkini*. In cases of *ettukettu* and *patinjarukettu*, the *salas* would be extended towards the north or the east, where the *ekasala* with the *ara* would still be put in either the west or the south. The existence of the *ara* and *nilavara* emphasizes the role of the paddy farming living culture that governs the traditional *ekasala* of Kerala.

Nalukettu and Nadumuttam

The houses of Brahmins, landlords and the royalty are usually courtyard mansions called *nalukettu* (*nalu*-four; *kettu*-hall-Malayalam*; Catusala*-Sanskrit). The courtyard house has been a fashionable and well-known typical house in India. It is called *Haveli* in North India*, Wada* in Maharasthra*, Rajbari* in West Bengal*, Deori* in Hyderabad*, Cathurmukham* in Tamil Nadu, and *Nalukettu* in Kerala (Rhandanawa 1999; Anand 2004)*.* The *Nalukettu* has been a popular representation of Kerala's traditional domestic architecture.

The *Nalukettu* can be multiplied to make a double *nalukettu* with two courtyards (*ettukettu),* and a fourfold *nalukettu* with four courtyards *(patinyarukettu*) following the needs of spatial extension. The plan or spatial boundaries for certain designs follow patterns that are prescribed in *Vastu*. The north and the east are given foremost importance, therefore a family temple and any religious relics are put here. The ladies room is usually put in the north facing south. The entrance can be alternatively in the south or west corner.

The subject of a courtyard house is apparently more complex than the *nalukettu*. South Kerala traditional courtyards have different morphology from those belonging to North and Central Kerala. South Keralan spatial division does not follow strict concentric arrangements as those of North and Central Kerala. The South Kerala *nalukettu* has a more extensive single hall with a courtyard-like inner opening, and the North Kerala *nalukettu* has a concentric multiplied *sala* encircling the courtyard. In North and Central Kerala, the courtyard can be very wide and is used for various activities, but in South Kerala the courtyard is usually very much smaller and works better as a water cistern. The activities in South Kerala's *nalukettu* are usually held not in the enclosed interior but in the open hall in the courtyard to encourage circulation. The *Arakalavara, pooja*/ prayer alcoves or rooms and the kitchen are the only enclosed space located in one or two quarters of the courtyard house. In contrast, in North and Central Kerala, the spaces around the courtyard work generally as a link that leads to the four-hall rooms. The North and Central Kerala courtyard performs specific functions such as a place for drying rice, water cistern, garden, or children's playground, while in South Kerala, spaces around the courtyard work as living spaces. Thampuran (2001) comments that the courtyard arrangement of the South Kerala *nalukettu* is simply a consequence of structural difficulties and the need for lighting and a water cistern. She regards the South Kerala open lay-out *nalukettu* and *nadumuttam* (courtyard) as basically a single hall structure with an opening in the middle (*mandapam* – Thampuran, 2001). She considers this type as more ancient and original.

Thampuran also points out that there is a courtyard house structure that cannot be really considered as a *nalukettu*, thus is regarded as pseudo-*nalukettu*. According to her, a *nalukettu* must have four comparable roof scales[v]. When one quarter is much bigger, the other quarters are regarded as an extension and are called *kuttikettu*. This is obvious in houses at Allepey, Kottayam and the Christian Syrian houses in the districts of *Thazhatangadi Theruvu* of Kottayam, South Kerala where the courtyard appears as a technical consequence of creating an annex building linked by two parallel rooms or passageways, the void in between buildings. This is also said to be a consequence of functionalism that was brought to India by Western missionaries.

The Eclectic Design of the Villa, the Muslim Veedu, *the Christian Syrian House and Other Types of Houses*

Compared to midland houses, those in the coastal cities and villages reflect more eclectic culture. The Muslims, Christians, Jews, Chinese and Konkanis as well as the Portuguese, Dutch and British left traces of their artistic style and structural form to the native houses. The Hindus make up the majority in Kerala but in the North Kerala coastal districts the second biggest group are the Muslims, while in the Southern coast of Kerala, it is the Christian Syrians. Typologies of Kerala's traditional-vernacular residential houses were partially or wholly taken as referent for stylistic adoption. What shows the ingenuity of traditional Malabar domestic architecture are the basic form of the single hall, the hipped, shingle roof, the *mukhapu* (gable), and the three arrayed room arrangement.

Cochin is becoming a melting pot of eclectic villas, mansions and palaces. Cochin and Quilon have been recorded as active seaboard cities since 1000 B.C., bound to the trans Mediterranean-China maritime trade. European-Indies designs, Portuguese arches, solid fort-like structures intermingle with the stereotypical Kerala wooden wall (*nira*), the *mukhapu* (gable), and intriguing bent roof shapes. Had they reached Kerala earlier, the Portuguese would have brought even more influences to Kerala's traditional houses, but even now, many Kerala traditional houses use Mediterranean arches and Classical posts. The Sree Padmanbhapuram Palace is the most representative expression of traditional eclecticism in Kerala.

Eclecticism can also be seen in formal spatial structure. Distinctive spatial structures are used in the *Kuttikettu* (pseudo-*nalukettu*) and European-Indies villa in which the spatial arrangements are more functional and organic. The houses are loosely referred to as *Vastu.* They vaguely echo the functions of the three-arrayed room. British architects tried to combine European and Kerala designs, and their efforts can be seen in the Napier Museum, the Bolgaty Palaces and the University of Kerala buildings. British architects utilize the physical characteristics and ornaments of the Kerala *ekasalas* but still retain the stereotypical symmetrical Classical rotunda spatial lay-out. In the Napier Museum there is sharp eclectic interior-exterior interface in which the Moghul style is combined with the mixed Western-Classical Kerala style. On the other hand, the Dutch showed more consistency to the typology of the house as a whole in adopting both layout and expression of the Malayali ekasala for the Bolgaty Palaces. There is only the obvious difference in scale and structure as well as the attachment of Classical elements such as a Roman portico. Palace architecture was influenced by the Dutch Palace, originally built by the Portuguese at Matancheri. Hindu temples and the early mosques were in the basic Kerala style; churches were rebuilt in the Portguese style, but in some particular cases, mixed with Kerala's spatial element and ornaments.

With increasing population density, the dense row houses run into a linear sprawl, giving Kerala an image of urban living. Local commoner villa houses are available in all places in rural

Kerala, and most of them use Kerala's vernacular architectures, creating an intriguing eclectic style. Portuguese Mediterranean arches, Burmese and Chinese ornaments, the Southeast Asian bent roof, Dutch functionalism, the European Classical column, and British Victorian Style add to the richness of Kerala houses. The houses reflect the equilibrium of mixed modern and traditional styles which still endures in the present modern living culture. They use a typical modern structural mass, which sustains the characteristic roof design. There are four types of masses: the I-shaped rectangular house which is the most common, the L-shaped, C-shaped and square shaped buildings. There are also three types of roof gestures: the bent roof with a gable at the end of its ridges, the hip roof with a gable at the end of both ridges, and the pure hip roof. The layout could be organic but mostly follows that of the three arrayed rooms arrangement.

Roof Construction

Roofs in Kerala houses reflect the outstanding features of shingle and bent roof construction. It reflects the logic of tropical sloping as seen in the shingle, hip, saddle roof and the span of eaves of the roof slopes. "Roof as crown" has been a metaphorical saying for architecture in Southeast Asia (Roxana Waterson: 1990). The *mukhapu (-*Malayalam) and bent roof design may not find comparisons in India itself but would be typically abundant in Southeast Asia, notably Malaysia, Minangkabau, Batak, Java, Thailand, and even Vietnam. The Kerala roof is likely to belong to old traditions. A replica of rafter construction has been found in the Kanchipuram and Tanjavur South Indian temples which date back to the 12th century. But the whole roof shape is similar to those used in the Majapahit villages depicted in relief in the 13th century temples. Reaction to the sun's glare is shown by the frequent use of latticed windows, seen from the most humble houses to the landlords' houses and even royal palaces.

Kerala's roof structures have three dimensional space frames. The basic structural elements consist of pairs of *kazhukol* (rafters) resting on an *uttaram* (wall plate). Pairs of *kazhukol* will meet on a *montayam* (ridge) to make the hipped roof. Pairs of *kazhukol* (rafters) would be bound by horizontal rods going through other pairs of *kazhukol*. This rod is called *vala*. Thus, the *vala*, *kazhukol, montayam* and *uttaram* become one unit of roof construction. The path of the *vala* determines the roof construction of Kerala houses as a three dimensional rigid space frame. Expressions of Kerala's roof construction include various designs of the pitched gable or *mukhapu,* especially in South Kerala. It seems that the *kazhukol-vala* construction was originally a simple rope-tied construction which is usually utilized in humble bamboo huts. This pre-thesis is strengthened by some sources that mention that in ancient times, the *nalukettu* is constructed out of bamboo.

Another interesting feature is a trapezoidal construction work that looks like the main arch structure in the wooden truss system of Gothic architecture, called *Viskhamba*. For a narrow hall, the roof construction needs only a pair of rafters (*Kazhukol*) tied on top by a one ridge

beam, both ends resting on a wall plate (*uttaram*). Both *Kazhukol* (rafters) are usually stiffened by a longitudinal beam and longitudinal stiffener called *valabandam* that clamp both kazhukol. If the hall is wide, the pair of *kazhukol* needs a stronger longitudinal beam, thus the original linear longitudinal beam was elaborated into an arch-like truss. Since it is probably difficult to elaborate a wooden arch, the structure becomes trapezoid. The main horizontal structural support, the *Uttaram,* will be divided into two layers: The first layer rests upon the lower *uttaram (varotaram)* which is on the wall, and the next layer is on the trapezoidal construction *viskhamba*. This second or the upper layer of the *uttaram* is called *arudhotaram.* Upon *arudhotaram* and the *varotaram,* kazhukols sit. It is believed that *pranah* (living energy) is residing in the uppermost wall plate (*uttaram*). A courtyard house is called *nalukettu* where there is continuous connectivity among the four quarters of the *salas*.

Typo Morphological Analysis

Typo Morphological Mapping

The typo-morphological mapping of the house plan in diagram 1 shows that the most basic spatial shelter structure found consisted only of the hall and veranda. This typical plan is currently found in the Kerala temple's sanctum (*Srikovil*). The veranda originally consists of extended overhanging eaves that protect the building from rain and the sun's glare as well as provide a sitting area attached to the house. Later the hall was arrayed into a chain of rooms for as many as functional space is needed, and the veranda was extended accordingly. Three arrayed rooms with a veranda is the most stable arrangement.

The arrangement of houses contains patterns consisting of several single halls of different functions. This could probably illuminate on the earliest type of house which is always built in the context of a compound. Remnants of a tribal house compound show that they used cooking spaces, living spaces, a grain storage hall and menstrual huts. The *Valiyaveedu* (community hall), the chieftain's sitting hall, stands separate among the compounds, acting as a landmark in the village. This kind of complex arrangement also existed in more elaborately designed landlord compounds where the *nalukettu* or *veedu* was supported by a *patthayapura* (grain storage hall) and a *pattipura* (gateway and guesthouse). The *nalukettu* kitchen has a special and important location in the north-east corner of house, but in the case of a commoner's house, the kitchen is on the same cardinal direction but standing in a different hall connected by a passageway. Most designs of the *nalukettu* do not have solid structures for the corner portions thus suggesting that the *Nalukettu's* mansion is not exactly a monolithic courtyard design but a complex of four halls crowned by one encircling roof, thus constituting a courtyard.

In an agriculturist family, the *ara* (grain store) reflects the role of agriculture in shaping the dominant living culture and social institutions. The *ara* became a basic spatial structure of the

ekasala in the traditional-vernacular peasant houses of Kerala. The kitchen is the most important room in the house and the *nalukettu*, it is comparable to the sacred courtyard. This practice came from a school of thought that usually puts the kitchen on the square of *Agni* (god of fire) in the north-west corner. It is probable that besides its functional significance as a domestic production space, the kitchen is associated with its earlier and tribal form – the hearth.

Other than the *ekasala*, the dual inner-living space and the three arrayed unit of inner and living space can alternatively develop into other types of spatial usage unnecessarily attributed to the *ara*, such as those in the vernacular houses of labor, the urban villa, and the rural commoner's compound.

The morphological development of the *nalukettu* from the elementary *ekasala* suggests two different traditions in courtyard house designs (Thampuran: 2001). One main tradition, mostly found in north and central Kerala, performs the *nalukettu* as a fourfold *ekasala*, arranged in a concentric way. Among the four quarters of the hall, the most important and most sacred quarter is that which contains the *ara-kalaavara.* A proper/formal courtyard as prescribed in *Vastu* may be found in these North and Central Kerala courtyard houses. Another morphological development of the *nalukettu* does not suggest any linear multiplication of the *sala* but an extension of the *ekasala* (Thampuran: 2001). This extensive enlargement, which is found mostly in South Kerala, performs the *nalukettu* with a very small courtyard (*nadumuttam*) and an open lay-out hall surrounding it. The less significant scale of the south Kerala Hindu *nalukettu* suggests that the layout contains more indigenous value.

The structure of open lay-out living spaces in the small courtyard is also amazingly found in the Muslim mansions and Christian Syrian *kuttiketu* but not as elaborated and significant as those in the Hindu houses. Some Muslim mansions also have courtyards but they are so small that even people would abandon it and use it merely as water cistern, while spaces around courtyard is is what is considered significant. This follows the typical pattern of the traditional *nalukettu* of South Kerala.

Eclectic Expression

Geographical locations also signify difference in expression or style. North Kerala creates more massive appearances in latterite construction. It uses hipped roofs, massive and solid latterite construction and wooden carvings and openings. Portuguese arches for windows and doors are used as well as Classical columns for porticoes and verandas. The Muslim compounds usually show particular ornaments for opening frame designs. And they are plentiful in Malapuram, Parapanganadi, Calicut and Cranganore. This may be explained by the fact that the Portuguese, Tamils and Muslims had once strongly influenced North Kerala. Tamill which was once part of the Madras presidency with North Kerala contributed the styles of Islamic arches.

South Kerala and Central Kerala contain lighter structures in timber. The style of South and Central Kerala can be obviously differentiated from that of North Kerala in the former's use of the bent or gabled ridge roof. Yet South Kerala houses (in districts of Pathanamthirta, Kottayam, Trivandrum,) are lighter than those in Central Kerala they used more wood. This may be obvious since Western culture, which enhanced the use of massive and earthen materials, was more influential in Central Kerala. Both South Kerala and Central Kerala architectural designs similarly showed intriguing, eclectic styles taken from the mutual exchanges with China, Burma, and also Southeast Asia. A four hundred year old *nalukettu* is still an enclosed house without a window, just like in Southeast Asia.

 The Role of Builder (*Thatchan/ Taccan/ Taksaka*)

        In Kerala, the architect is called *thatchan* or t*accan* or builder who follows certain norms, passed from generation to generation through scholarly or hereditary means, which therefore have a traditional base. Theoretically, Indian builders are hierarchically put in four ranks according to their skill and rank – *Sthapati* (architect)*, Taksaka* (builder)*, Vardakki* (supervisor)*, Sutragrahi* (labor)– where *taccan* theoretically is comparable to *taksaka*. But apparently, Kerala's *taccan* is an all-round artist who is not familiar with such hierarchy. Even the higher rank of *taccan* was not considered as *Sthapati* or master architect, but just *Perumtaccan* or "master *taccan"*, or "master builder." It was only later when *Brahminism* gained status especially in temple design that some of the responsibility of the *thatchan* was given to a Brahmin, such as conducting *poojas* (prayers) before construction. There are some regional treatises (*Vastu*) available, i.e. the *Manusyalaya Candrika,* and *Thatchusastram*, that say that these thatchan function only as designers.

        A *thathcan* did not make only a house, but anything that needs carpentry including boats. The *taccan* can be a very unique, ambiguous and plural personality. Traditionally, a *taccan* belongs to a Sudra caste, the *Ashari*. Amazingly, they are temporarily considered Brahmins when involved in construction work. They would be requested to be clean, vegetarian and conduct *poojas* (prayers). They may be temporarily released from *untouchability* and allowed to enter the house of nobility or a Brahmin to work out his plan (Jayaraj 2004).

        Yet, there are a lot of exceptions to the mainstream treatises that prevail. These exceptions indicate the ingenuity of the Kerala builder traditions. There are two major skills of construction practiced in Kerala, namely, laterite masonry and wood carpentry, yet only wood carpentry appeared in *shastram* or science. And practically, the laterite mason or *Kalaseri* was considered subordinate to the *thatchan* or carpenters. Perhaps laterite construction and monolithic building are not deeply indigenous traditions, but brought in by the Portuguese or by the people beyond the northern borders of Kerala (South Karnataka).

Conclusions and Recomendations

Basically, environmental determination molds the shelter design's tradition. The wet tropical environments of both Kerala and Southeast Asia create typical architecture with the following characteristics:
1. Use of shingle roofs and protruding eaves as response to tropical rain, wind and other natural elements
2. Use of grilled windows and porous walls as response to tropical sun glare
3. Significance of the rectangular I-shaped building mass
4. Open lay-out living spaces

The following are observations generated by the study of Kerala houses:
1. There is an appreciation and knowledge of the architectural importance of the multi-cultural aspects of the traditional-vernacular architecture of India whose gestures are like those in Southeast Asia.
2. They are still currently part of the living traditions.
3. The continuum relations between South Asia and Southeast Asian architectures show similar impulses in the melting pots with multi-cultural influences such as South India, Srilanka, Maldives, Bengal, Nicobar and the Andaman islands, the Lakshadweep islands and the Southeast Asian archipelago. This phenomenon created an eclecticism that began in the early modern history of Asian architecture.
4. The European colonialists enforced interchange, encouraged the multiplicity of culture in South Indian architecture and enriched the vocabulary of Kerala architectural style with their own style.

The typological connection between Kerala and Southeast Asian traditional architecture could be reflected in three periods of influence. Linguist Jean Przyluski (1929) revealed how in much earlier times of the Pre-Aryan and Pre-Dravidian age, people who spoke Austro-Asiatic languages were present in populated parts of India. They have a common ancient linguistic gesture which is assumed to have been derived from Southeast Asia, thus suggesting that India and Southeast Asia were once culturally bound. This period belongs to the *Proto-Austroloid* stock of pre-Aryan and pre-Dravidian India. The analysis of Kerala's tribal architecture showed how the tribal living culture in Kerala reflected similarities with the traditional-vernacular traditions in Indonesia. These include the non-hierarchical communal governance and acknowledgement of *valiyaveedu*, linear settlements, exterior living, and single hall multifunction house. This culture still survives in tribal villages in the high ranges of the Attapady.
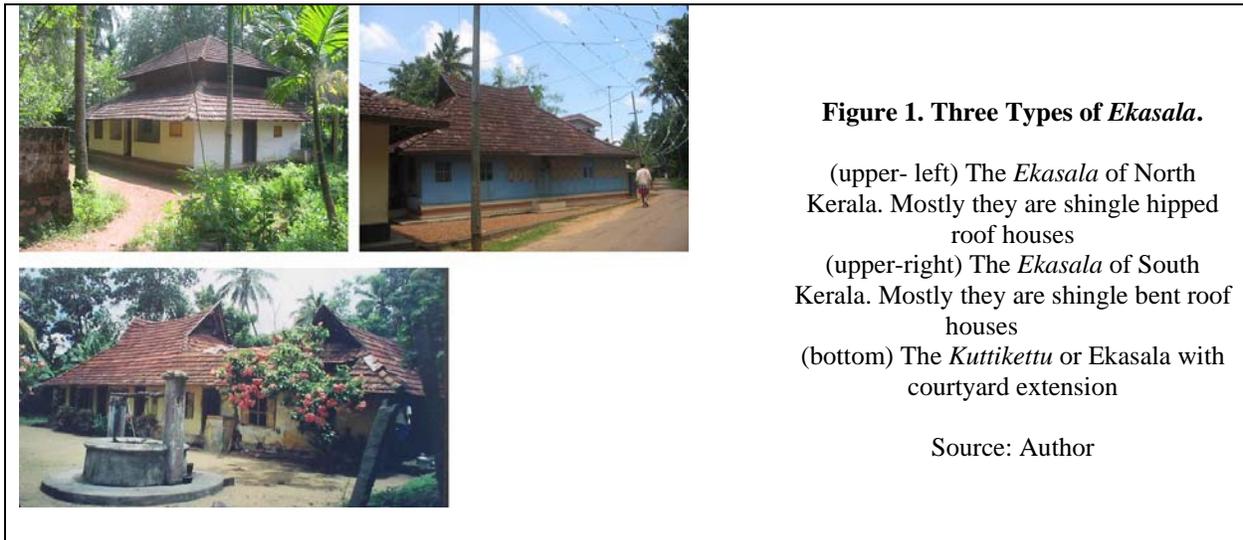
Globalization in the 13th-16th centuries had once spread through the web of Asia. Kerala and Southeast Asia has been in contact or bound since ancient times. Generally within this historical

scheme, Southeast Asia is often described as *Indianized* states (Coedes 1969). But the eclecticism that was obvious in Kerala's architecture suggests how Kerala also inherited some vocabulary of architectural forms from Southeast Asia. Bent and shingle roof designs, raised platform of the *ara* were well illustrated in the depiction of houses in the Borobudur temple and East Java's temples of the 8th-12th centuries.

The coming of the European colonizers in the 16th century brought colonialism to Asia, and consequently, on the one hand enhanced the architectural tradition with diffusion of European architectural vocabulary into the native tradition, and on the other hand reinforced the cultural mutual exchanges of both South Asian and Southeast Asian culture through trading and political relations. The usage of Classical architectural elements, the introduction of tiles and massive construction, the *Victorian* style and functional approach in design, the refined design of openings had elaborated Kerala's architecture into eclectic designs.

Kerala traditional-vernacular architecture enhances the discourse of eclectic architectural design before the West formalized colonization and its monopoly over the Asian trade network. The architectural designs of the period suggest an intermingling of cultures that happened ingenuously. Multi-layer historical narrations should be able to explain eclectic modes of development that brought about the spread and transformation of the style. The pre-European and Colonial traditional architecture of Kerala can be cited as a good example of a multi-cultural design morphology. Trading ports such as Cochin developed around the 13th-19th centuries. Cochin is probably one among the very few traditional trading ports in Asia that sustain the living artifacts that survived.

In conclusion, Kerala architecture is not simply Indian architecture. Kerala architecture in general has shown cross boundary and multi-cultural architectural styles and gestures. The same phenomenon may have happened in other peripheral spots such as along the *Silk Road* which passes Nepal, Madagascar, and other states that were once occupied by European colonizers. The phenomenon is very similar to current architecture that follows late Capitalism where it is much more difficult to distinguish among the architectures of different nations since the popularity of the *International Style* and *Post-Modernism* after World War II. Globalization in many ways has always been altering the map of local visual experience while exhibiting typical acculturation which could lead to the evolution of a homogeneous new style or an eclectic style.
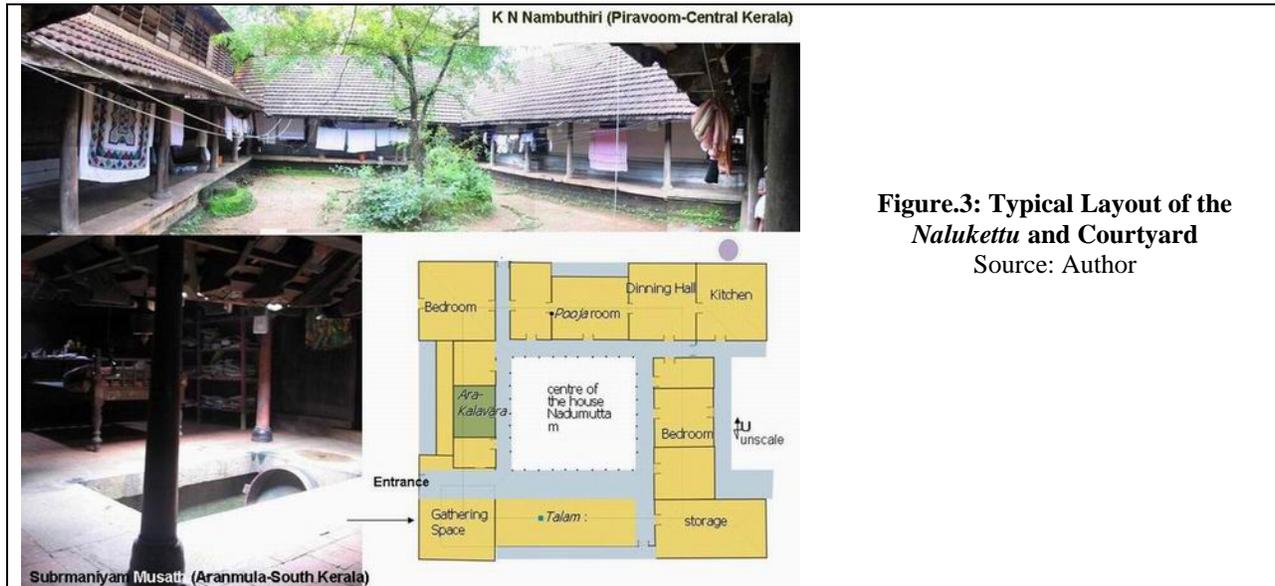
Figure 1. Three Types of *Ekasala*.

(upper- left) The *Ekasala* of North Kerala. Mostly they are shingle hipped roof houses
(upper-right) The *Ekasala* of South Kerala. Mostly they are shingle bent roof houses
(bottom) The *Kuttikettu* or Ekasala with courtyard extension

Source: Author

Figure 2 Three Typical Expression of *Nalukettu*
Central Kerala (above), North Kerala (left-bottom), South Kerala (right-bottom)
Source: Author)

Figure.3: Typical Layout of the
Nalukettu **and Courtyard**
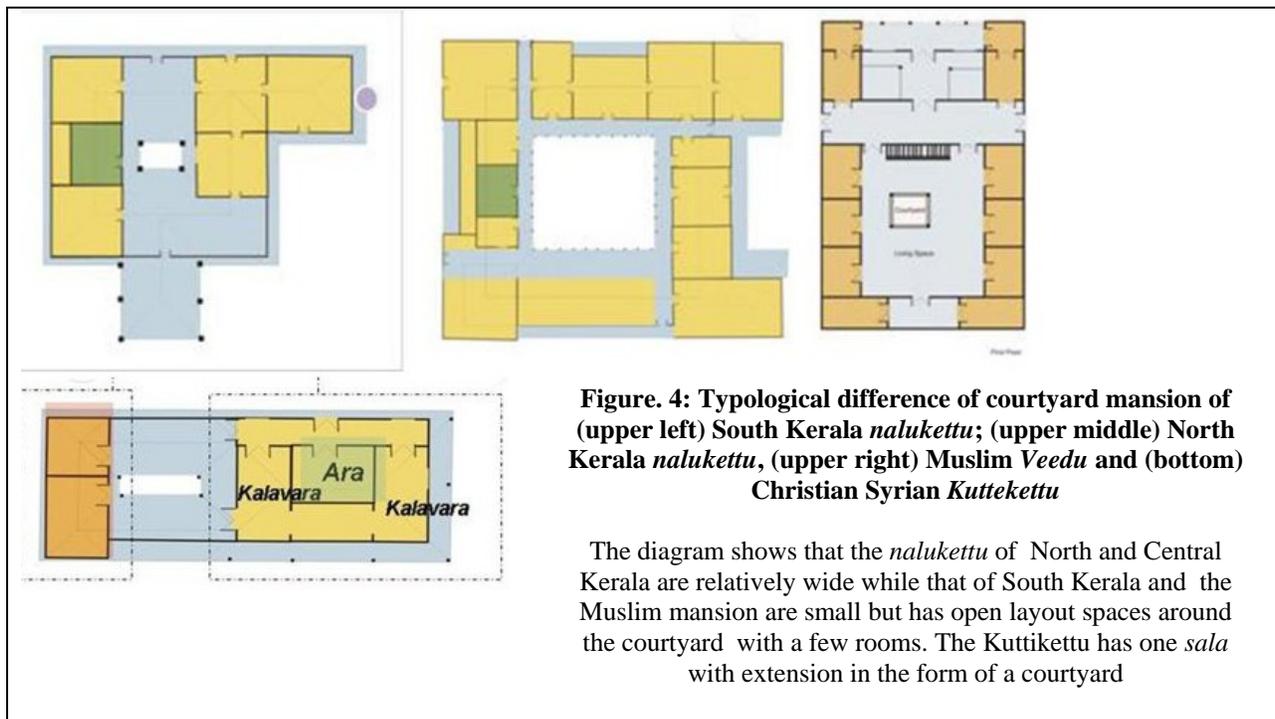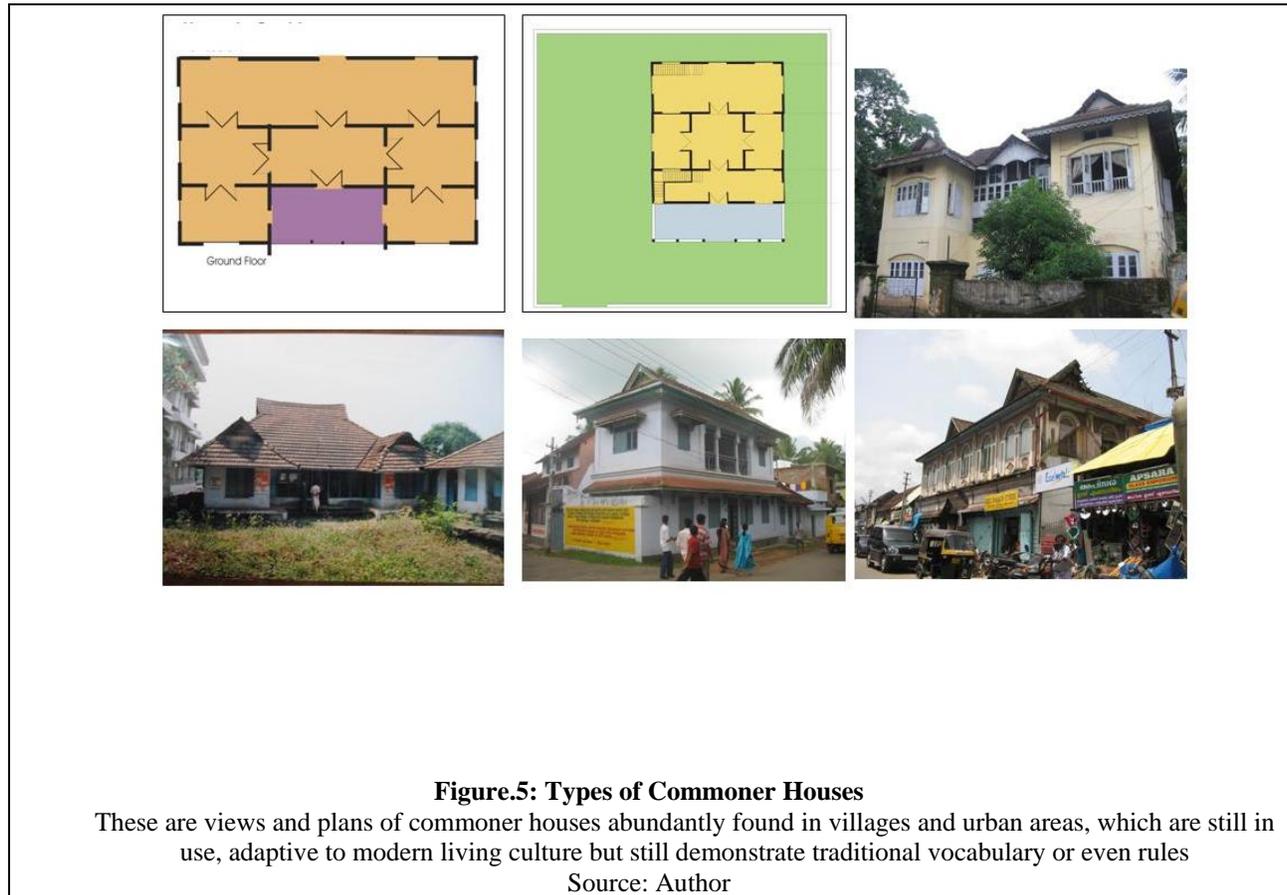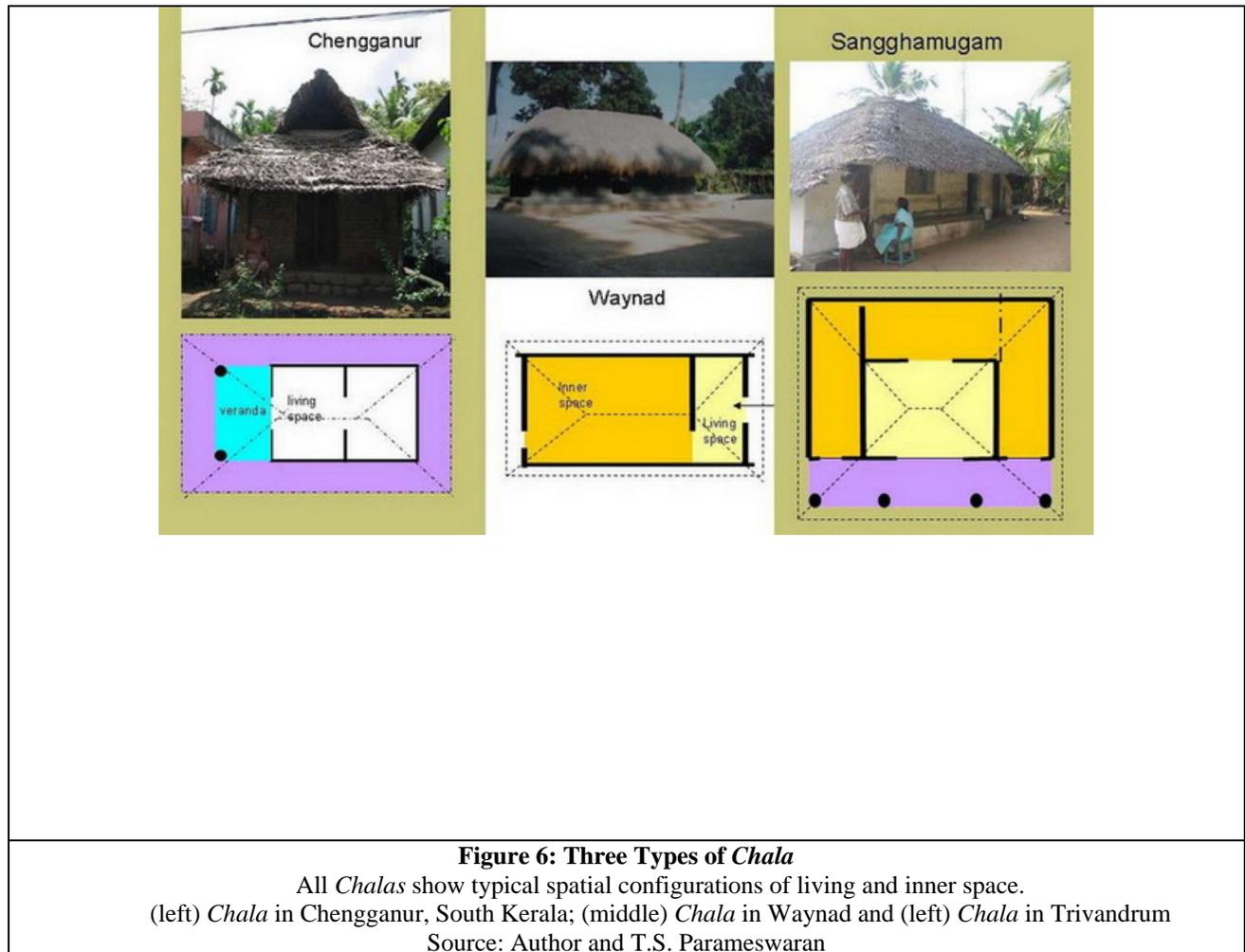Source: Author

Figure. 4: Typological difference of courtyard mansion of (upper left) South Kerala *nalukettu*; (upper middle) North Kerala *nalukettu*, (upper right) Muslim *Veedu* and (bottom) Christian Syrian *Kuttekettu*

The diagram shows that the *nalukettu* of North and Central Kerala are relatively wide while that of South Kerala and the Muslim mansion are small but has open layout spaces around the courtyard with a few rooms. The Kuttikettu has one *sala* with extension in the form of a courtyard

Figure.5: Types of Commoner Houses
These are views and plans of commoner houses abundantly found in villages and urban areas, which are still in use, adaptive to modern living culture but still demonstrate traditional vocabulary or even rules
Source: Author

Figure 6: Three Types of *Chala*
All *Chalas* show typical spatial configurations of living and inner space.
(left) *Chala* in Chengganur, South Kerala; (middle) *Chala* in Waynad and (left) *Chala* in Trivandrum
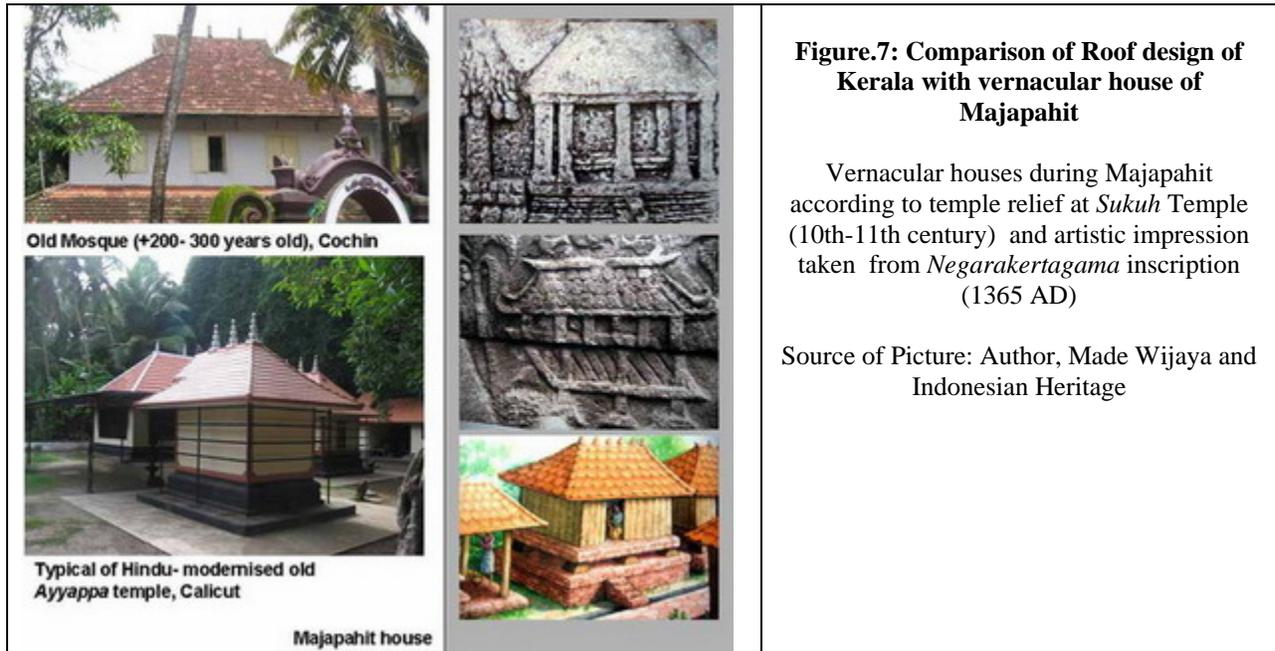Source: Author and T.S. Parameswaran

Figure.7: Comparison of Roof design of Kerala with vernacular house of Majapahit

Vernacular houses during Majapahit according to temple relief at *Sukuh* Temple (10th-11th century) and artistic impression taken from *Negarakertagama* inscription (1365 AD)

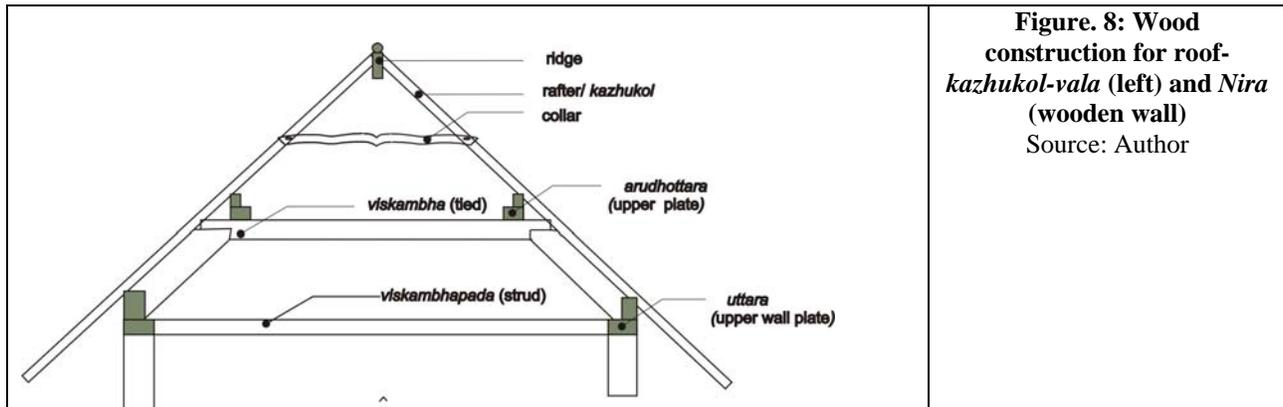Source of Picture: Author, Made Wijaya and Indonesian Heritage

Figure. 8: Wood construction for roof- *kazhukol-vala* (left) and *Nira* (wooden wall)
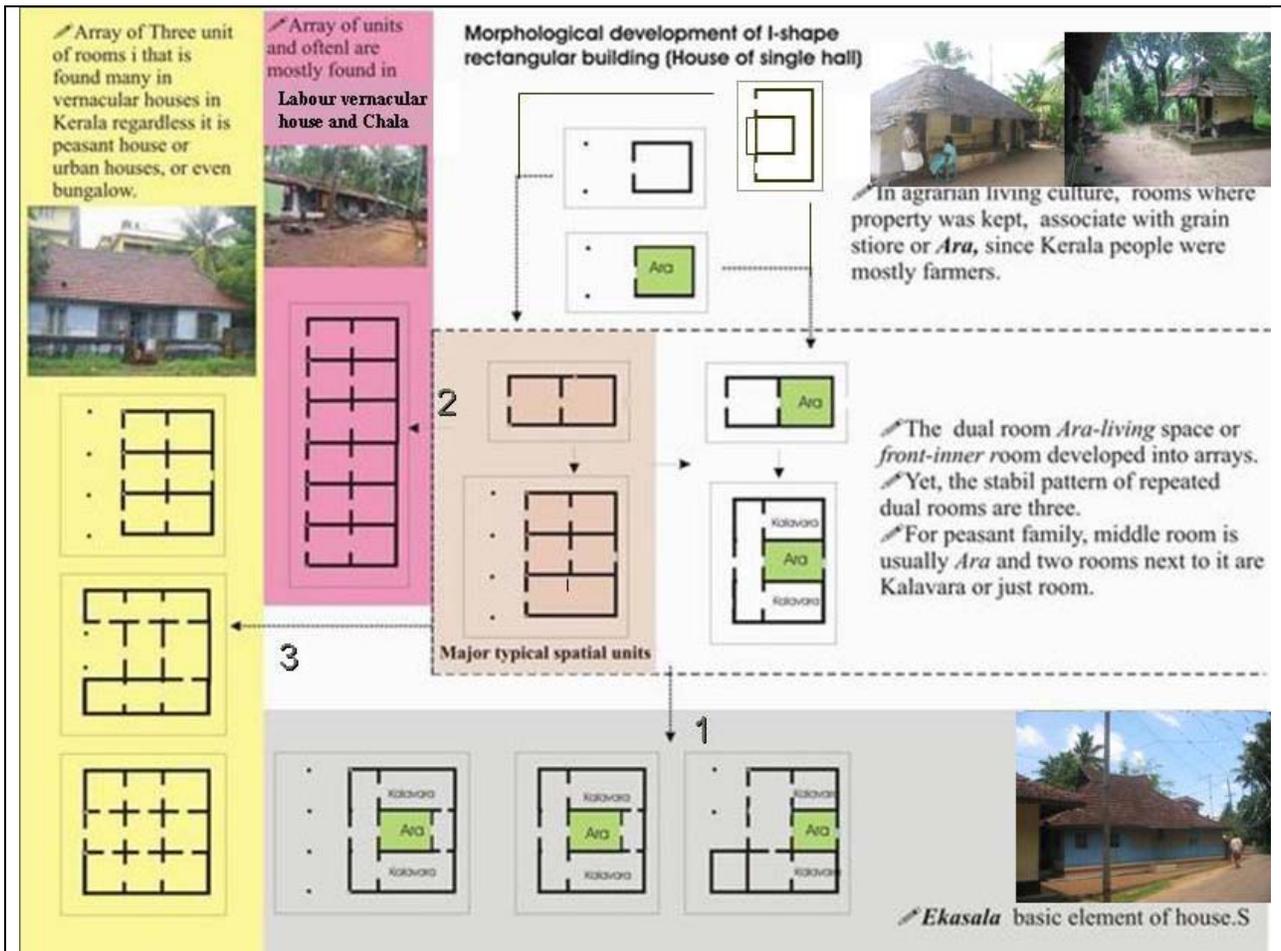Source: Author

Diagram 1: Morphological Development of Single Hall House
The diagram shows three different morphological paths of three-arrayed rooms, which are the morphology of the Ekasala (bottom), labor vernacular houses and *Chala* (left) ; and Commoner houses (far left)

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[i] *Mayamatam* is a traditional treatise of Architecture and Settlement of India, composed between 14th-16th centuries, which is considered to be Dravidian. *Mayamatam* and *Manasarm* hve been regarded as the most complete Indian architectural Vastu. *Manusyalaya Canndrika,* and *Thatcushastram* are special treatises of Kerala. The roof structure of Kerala is found nowhere else in India but Bruno Dagens (2000), in his translation of *Mayamatam,* compares Kerala's roof structure to illustrated Indian roof construction in general.

[ii] Various studies have indicated a Negrito strain in Pre-Dravidian population (A.H Keane, in Iyer 1908 in KS. Singh 2003). The Negrito were submerged at an early period by the (proto) Austroloid. The Dravidian people are [ii] of lower caste believed to have migrated from the Mediteranean area (Iyer, 1970; Menon, 1967, in Singh, 2002).

[iii] Jeevan (2000) argued that the existence of only three castes in Kerala is a product of social polarization brought by the Brahmanism tradition from the north when the Aryans came. The Nambuthiri Brahmins are mostly landlords, the Nayars are khsathriyas (middle-class) who mostly did property management of the Brahmin landlord's assets, and workers. The latter are originally of the same stock with Nambuthiri but did not have as much land as the Nambuthiri. The rest were *sudra* (low class) or inferior caste taken as slaves or workmen, and no *Veicya*.

[iv] Notable slight resemblance of phoneme for places, such as *Kochi* in Japan, *Cochin-China* in South Vietnam, and *Cochin* or *Kochi* in Kerala may signify remarkable commonalities in the traditional roof design of the three countries.

[v] The course of one hall/*sala* is defined by the *uttaram* (annular wall plate). One *sala* should be defined by the annular that ties the four walls. In the Kerala house, the *uttaram* may appear in levels following the length or span necessary. The highest level *uttaram* is called *arudham*, and is the most important *uttaram*. A *nalukettu* that perform *catusala* should have an *arudham* in each of the four *salas*. The four *arudhams* of each quarter must have the same level and height. In the case of the South Keralan *nalukettu*, the entire courtyard house has only one *uttaram* (annular wall plate) that embraces the four quarters at once. Ashalatha Thampuran hypothetically marked this kind of *nalukettu* as basically an extended *ekasala*.