

# ANALYSING THE MORPHOLOGICAL CHANGES IN VERNACULAR DOMESTIC ARCHITECTURE OF KERALA, INDIA SINCE 1947

B S Bhooshan, Manoj Kumar Kini

## Abstract

This paper discusses morphological changes in the vernacular domestic architecture in Kerala since 1947 (Independence of India from colonial rule) and identify the changes and analyses the reasons behind these changes. The study focuses on the gradual and vernacular architectural developments happened within the study region owing to several factors like social and political reforms and related, government initiated land reforms, migration to other parts of India and to foreign countries in search of better jobs and income, related economic factors, colonisation, change in technology and work expertise, change in materials, change in lifestyle, global exposure through channels and other communication system, climatological factors etc. The vernacular domestic architecture has undergone tremendous transformation owing to these factors and can be identified with specific typologies emerging. The major questions posed here are,

1. Can visual memory of Vernacular transferred to the contemporary architecture be considered vernacular or even designed vernacular?
2. What is the essence of Vernacular? Can we decipher the Diacritical mass that makes something remain vernacular and something

cross the borderline?

3. Vernacular is ever evolving. Is there a stop point for a continuing vernacular construction practice? How do we define the tipping point, if any?

**Keywords:** Vernacular, Domestic Architecture, single Aroodam house, Dwelling, Kerala

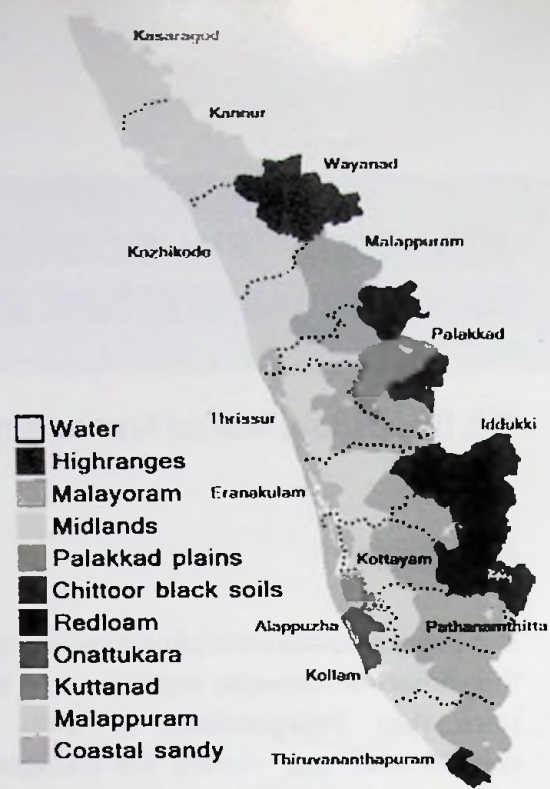
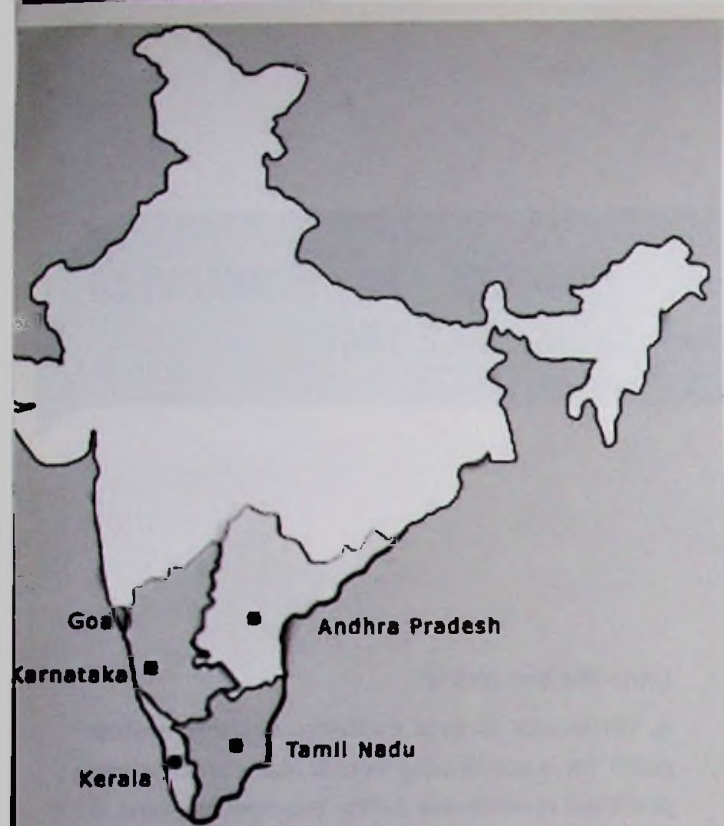


Figure 1: Map showing Kerala and its location (not to scale) (source: <http://www.prokerala.com/kerala/maps>)

Kerala (in South India) architecture is one of the most evolved examples of wooden construction and timber joinery having had multiple foreign influences<sup>1</sup>. Kerala has seen transformations and changes in cultural and economic landscape, especially in the last century. The traditional construction practices evolved accounting for local needs, materials and skills. The production process was dominated by artisans themselves<sup>2</sup>. Requirements of thermal comfort in the tropical climate as well as the inhibitions and restrictions governed by social structure and cultural practices defined the evolution of typology of spaces and roof forms and construction details. But they were also governed later by construction details ordained by the indirect influence of classic treatises propounded by priestly pundits<sup>3</sup>. To this extent, a classic vernacular evolved. The common use of the term “vernacular” is not the same all the times. Therefore it is imperative to explain the meaning of that term

as used in this paper. Considering a working meaning, ‘vernacular’ houses are “those built of traditional materials and in the style of the locality”. They are designed generally by amateurs, in this case the local masons, artisans and carpenters or occupants themselves, going by the local conventions and their own requirements as well as the means available with them<sup>4</sup>. Therefore, the function becomes the most important feature. Tradition guided the construction and the local materials were an obvious choice for construction. It is ‘architecture without an architect’ (any other professional as known today) in contrast to other buildings designed by an architect/engineer, who are formally educated<sup>5</sup>. The case of Kerala is as indicated a case of classical vernacular, which may be contrasted with more amateur owner built forms elsewhere. The carpenters were original professionals there in that sense. The natural building materials available for construction in Kerala i.e. stones, timber, clay

<sup>1</sup> P 52-56, the legacy of kerala Dr A Sridhara Menon, 2008

<sup>2</sup> P 1-3, Traditional architectural forms of the Malabar Coast, Dr Ashalatha Thampuran, 2008

<sup>3</sup> P 52 the legacy of kerala A Sridhara Menon, 2008

<sup>4</sup> P 2, Traditional architectural forms of the Malabar Coast, Dr Ashalatha Thampuran, 2008

<sup>5</sup> P116-118 kerala smaskaram, A Sridhara menon

and palm leaves have anchored and guided the construction practice since ages. Due to the limitations of building materials, a multi modal approach of construction was evolved in Kerala. Stone work was restricted to the plinth even in prestigious buildings including temples and palaces. The indigenous adoption of the wood (available in plenty) for architectural expression thus became the dominant feature of the Kerala architecture. The carpenter was the presiding artisan, often governed by the detailed rules of traditional joinery called 'thachu shastra'<sup>6</sup>. The vernacular tradition has evolved giving rise to many house forms longitudinally and latitudinally along the Kerala region. One of the most distinguishing features of settlements in Kerala and people's living habit has been detached homesteads or houses. To this day the domestic architecture of Kerala follows the style of detached building. It has not changed much.<sup>7</sup>

However, the changes in the economy, social conditions and position of women in society have all created newer demands of space. This along with the introduction of new technology, more so the RCC<sup>8</sup> and scarcity of timber, changed the construction techniques. The import of cultural artefacts through education and work and migration also influenced the living styles. Together with the craving for novelty, searching a new identity derived from past albeit manufactured one often, is in the process of creating a new vernacular life style and architecture<sup>9</sup>. The mason became the prime artisan usurping the place of the carpenter. Yet, the imagery lingers and is being

reinvented, in various ways often in a curious mixture. The autonomous, (without conscious professional design) changes in the house forms seem to undergo changes in smaller quantities at a time retaining some features and changing some others. There are conscious efforts to deviate substantially and at the same time there are conscious efforts to retain the traditional features. The question to be asked, however, is what is the critical mass of the features which retains the original flavour and what features deviate away.

The paper is to bring to light the changes that have happened in the vernacular traditions in Kerala over the years and to analyse the morphological and typological transformation of domestic architecture special reference to post independence period. More in a conceptual framework analysing known sources and not with elaborate field work. The case studies analysed has been identified from, Kollam region of Kerala state in S.India. The primary data was collected by documenting some cases in this region. A number of cases were analysed to identify the elements that contribute to the visual memory of vernacular architecture among which the roof was identified as the predominant one.

Based on this, the two commonly found house typologies of Kerala region are

1. **Independent house with single aroodam, (about 80%)(otta thai)**<sup>10</sup>
2. **Single house with courtyard (a Nalukettu. (less than 20%)**<sup>11</sup>

<sup>6</sup> The traditional treatise of timber construction of Kerala region

<sup>7</sup> P53-55 evolution of kerala history and culture prof T K Gangadhran

<sup>8</sup> Reinforced Cement Concrete

<sup>9</sup> P 297 cultural heritage of kerala ,A sridhara Menon

<sup>10</sup> Arudam is also known as thai uttaram,thai means mother in southern kerala as noted in p no 104,traditional architectural forms of Malabar Coast Dr Ashalatha thampuran

<sup>11</sup> P 30,Traditional architectural forms of Malabar Coast Dr Ashalatha thampuran



Figure 2: A single aroodam dwelling, Kalangara house, in Chavara, Kollam, Kerala India

## Single Aroodam houses (otta thai)

All the morphological variations found in this region are invariably an improvised morphological variation of any of these typologies. The single aroodam house is the most common and easily adoptable typology that has continuously been reinvented from 9th century to the present day<sup>12</sup>. The study is focused on the morphological analysis of the single aroodam house (otta thai) from the past to the present.

Kerala has made its notable contributions to the science of architecture, both secular and religious. The *Tantrasamuchaya*, *Vastuvidya*, *Manushyalaya-Chandrika*<sup>13</sup> and *Silparatna* are well-known treatises on the subject<sup>14</sup>.

The traditional houses of Kerala were mostly built in accordance with the principles of 'Thatchushastra', the science of carpentry and 'Vaastushastra' the ancient Indian interpretation of architecture.

The dwelling form directly reflects the structure, the relationship and functioning pattern of the family/society, which in turn come from a common culture, a common unwritten set of rules or codes that are accepted and followed by a collective will. Observation method is used to assess the

importance or significance of the physical change apart from simply identifying the direction of change. While analysing it is to be understood that the changes could be either 1. core/fundamental changes or 2. peripheral/superficial changes

**Core/fundamental change:** these are changes noticed in the built form which suggest a very fundamental or significant change in the vernacular idiom. Any significant change to the core concept and physical elements of the existing vernacular idiom would mark a fundamental change. These could be change in the spatial organisation, planning layout, functional/aesthetic elements or usage of spaces in a single building.

Peripheral/superficial changes are changes in the aspects of built form that suggests that the fundamental ideologies or beliefs of the user group have not changed. Such changes would therefore not be seen in the core spatial distribution or concept and physical elements. There can be superficial skin changes in the way elements are detailed out with regional dialectic variations. This constitute mostly of scenographic elements.

In this paper we are focusing largely on the fundamental changes that happened in the *single aroodam* typology.

<sup>12</sup> P 30-32 Traditional architectural forms of Malabar Coast Dr Ashalatha thampuran

<sup>13</sup> The *Manushyalaya Chandrika* is a treatise devoted to domestic architecture of Kerala region by mangalathu neelakantan namboothiri.

<sup>14</sup> P 52 the legacy of Kerala Dr A Sridhara Menon

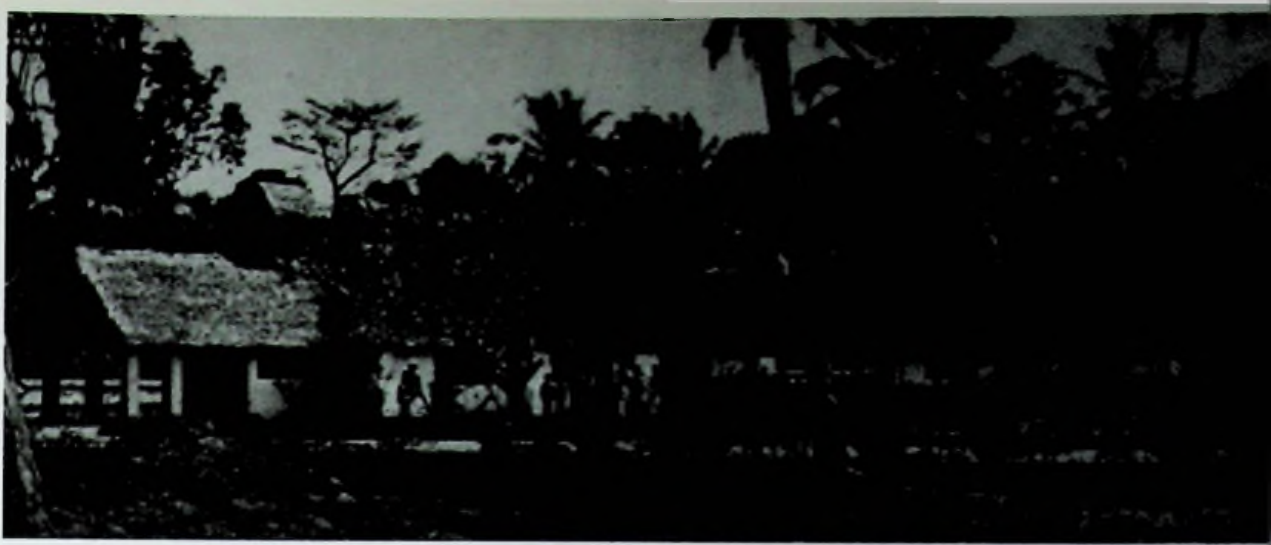


Figure 3: Traditional house form of Kerala, Mavelikkara (Archives, British library) the figure shows a typical single aroodam house of central Kerala region with a poomugham in the front. The predominant identifying feature is the thatched roof.

## House form

The early single aroodam house models were huts made of bamboo frame thatched with leaves in circular, square or rectangular plain shapes. The rectangular shape with a hipped roof appears to have been finally evolved from climatic and functional consideration. Structurally the roof frame was supported on the pillars on walls erected on a plinth raised from the ground for protection against dampness and insects in the tropical climate. Often the walls were also of timbers abundantly available in the land. The roof frame consisted of the wall plate which supported lower ends of the rafters, the upper ends being connected to the ridge. The interesting feature of this method was of developing the rafters of both opposite slopes together and tying them with a series of ties thus making the rafters function as an A frame. Use of trusses was totally avoided. The weight of the rafters and the roof covering created a sag in the ridge when the ridge piece was made of flexible materials like bamboo<sup>15</sup>. This sag however remained as the hall-mark of roof construction even when strong timber was used for the roof frame.

Further gable windows were evolved at the two ends to provide attic ventilation when a flat ceiling was incorporated for the room spaces. This ensured air circulation and thermal control for the roof. The lower ends of the rafters projected much beyond the walls to shade the walls from the sun and driving rain. The closed form of the Kerala houses was thus gradually evolved from technical considerations. The main door faces only in one cardinal direction and the windows are small and are made like pierced screens of wood. The rectangular plan is usually divided into two or three activity rooms with access from a front passage. The projecting eaves cover a verandah all round, protecting the wall from both sun and rain. The roof was the decisive factor for the development of the two-dimensional layout. The traditional timber roof architecture was highly evolved designed joinery detailing. The *thatchan* (master carpenter) was the chief person who decided the size shape and height of the structure. The aroodam (rectangular base plate) was assembled first and used to be raised at the predetermined height above the plinth with the help of temporary wooden supports. The rafters (forming the roof called *koodu*) were made at

<sup>15</sup> Observation from the Case studies conducted by author as a part of, Phd programme at CEPT Ahmadabad



Figure 4: A single aroodam house with pathayappura, at chavara, Kulangara house, chavara, kollam, kerala .the koodu is supported by the aroodam(wall plate supported by the wall and the wooden pillars.

ground with precision. The walls were raised to touch the Aroodam and then the *koodu* is assembled above. Thampuran's study also makes this point<sup>16</sup>. Additional spaces were created around the central rectangular Aroodam by the way of lean-tos locally known as *chayipu*. These construction practices were based on highly evolved geometrical patterns of roof (timber) based on authentic treatises (classical vernacular roofs) and was strictly followed in design and construction. All extensions to the basic Aroodam were lean-tos which provided for individual innovations.

## The plan

The plan form is basically a rectangle divided into segments. These plan forms are self contained independent residential units which take care of different activities associated with a residence. As Dr.Thampuran points out the core of the *ekashala* is used for storage, living and sleeping whereas the extensions take care of the supporting activities<sup>17</sup>. The central

segment was the prominent space called *akathalam* connecting all the peripheral segments. The walls of the central segment support the aroodam. The surrounding segments are created by extending the rafters from the aroodam to the periphery of the wall. These segments are technically called *chayippu*. These *chayippu* in the entrance side (usually from East or North) is usually named as *irayam*, or *kola* for receiving and seating guests. The *pinnapuram* behind for multipurpose related to the household or rooms for sleeping (*ara*) or storage (*pathayapura*)<sup>18</sup> on the sides. In certain cases some of the *chayippu* are kept open as *vernadahs* used by female and child members of the family. Some earlier studies have recorded many variations of this basic roof configurations.

**Transformations:** This basic plan of central segment (*akathalam* and the surrounding spaces generated by extending the rafters (*chayippu*) were Common features in the single aroodam houses of the past as noted. The rectangular geometry was kept intact for most transformations until the early half of last century. The new spaces or rooms

<sup>16</sup> Koodu is the composed wooden frame of the roof form of traditional buildings

<sup>17</sup> P 128, traditional architectural forms of Malabar coast, Dr Ashalatha Thampuran

<sup>18</sup> This is the grain store of traditional house in kerala

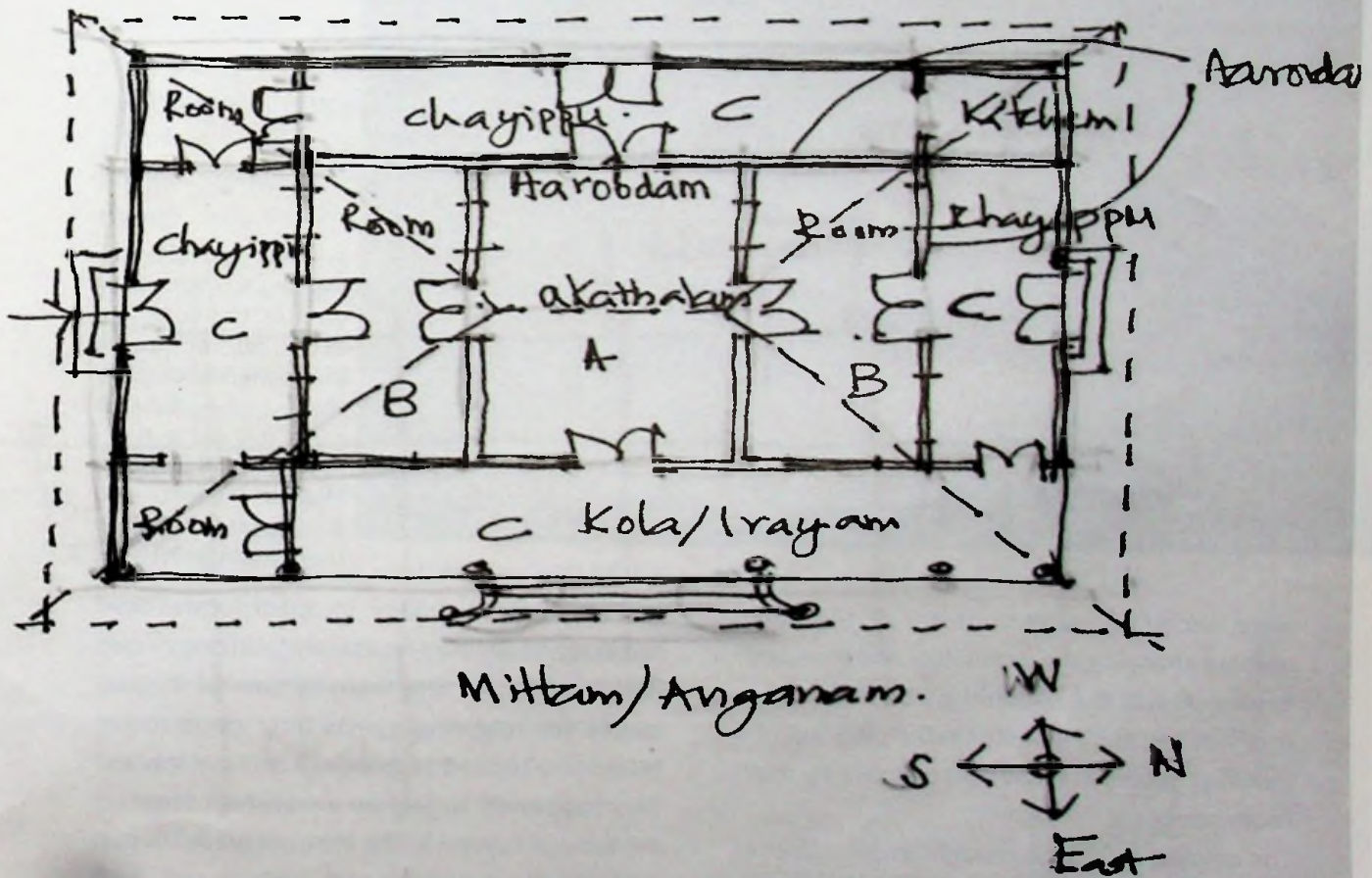
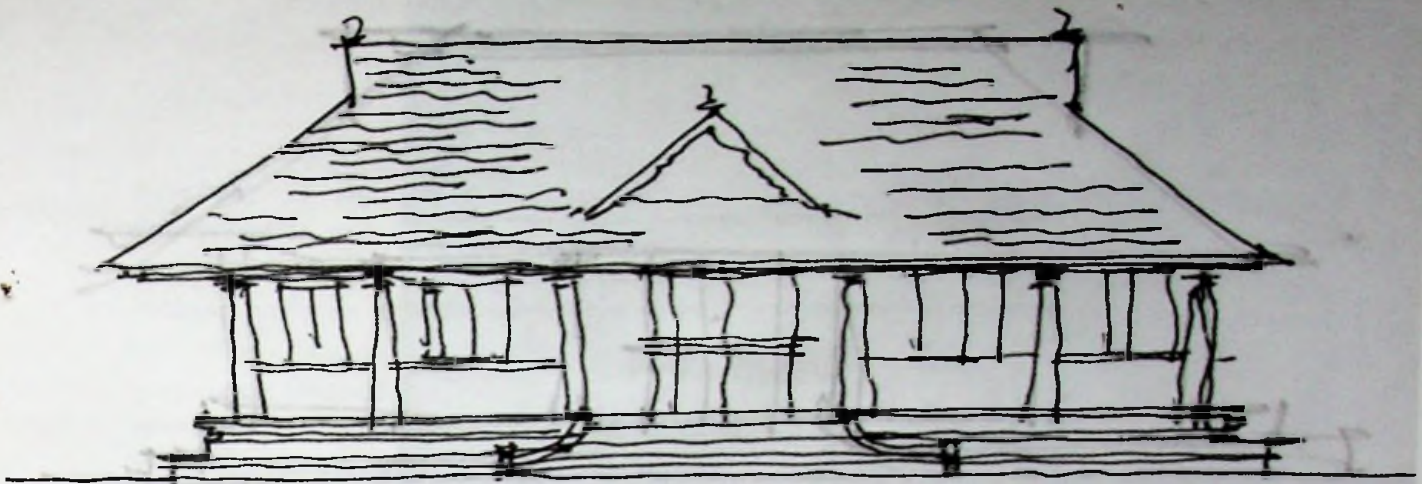


Figure 5: a schematic sketch showing the typical space layout of a single Aroodam house. The central place contains the three rooms here. The position of the kitchen could be in any of north east or northwest corner usually.

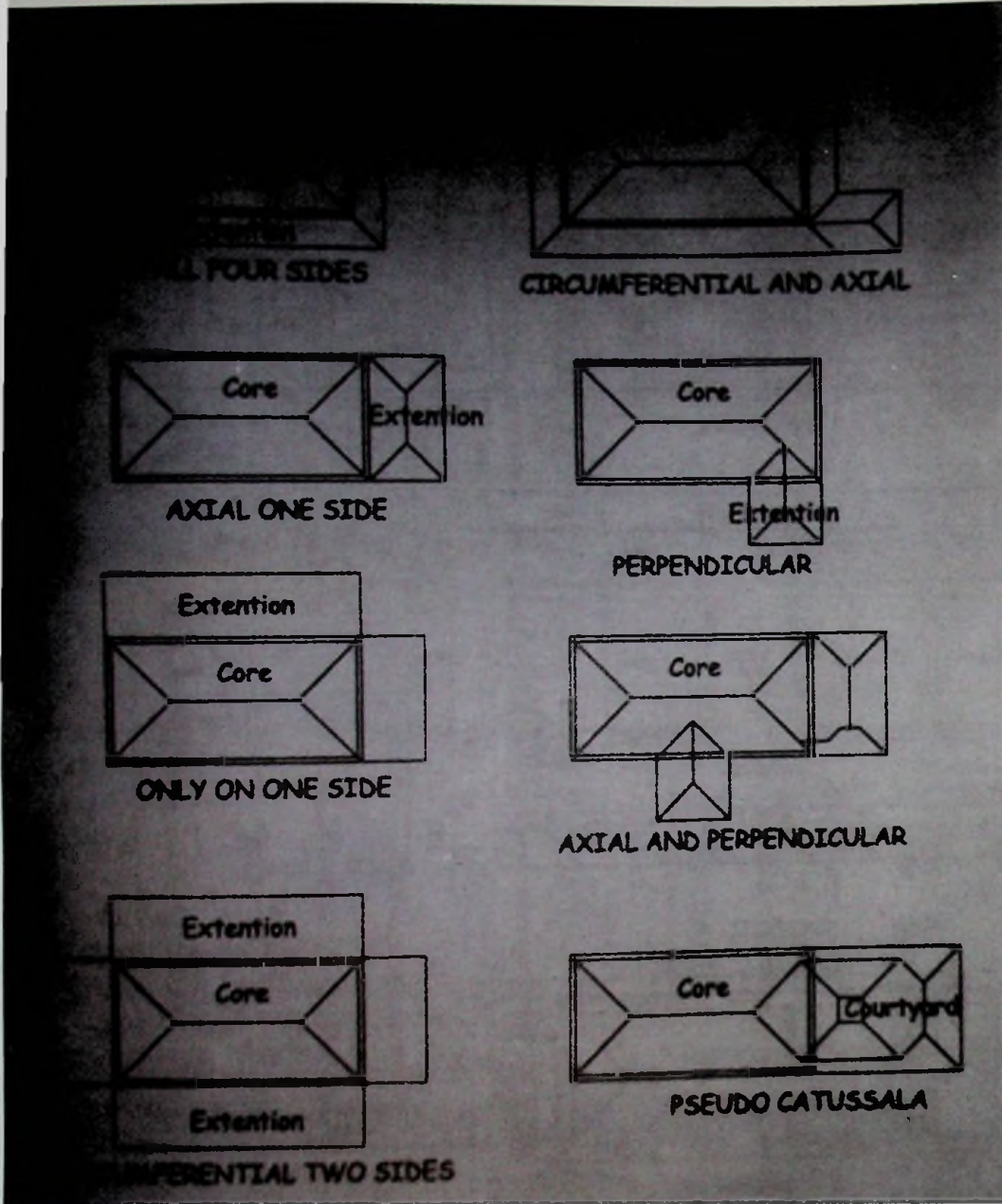


Figure 6: Variations seen in the Core and extension of single aroodam houses (otta thai), Source: (Traditional Architectural forms of Malabar Coast, Dr. Ashalatha thampuran,2001)

were added as extensions to all the sides without changing the akathalam and aroodam. In other words the koodu/the traditional rafter roof was the guiding factor in the planning of a dwelling space, a single room house to multi room houses.

The colonial influence brought in a number of changes like increase in the size of the rooms, concept of furniture and attached bathrooms and relative increase in the height of the structure the basic single aroodam with central segment continued as a typological pattern. Attached extensions were made to the central

space to all the sides to incorporate new needs. Basically two fundamental changes can be observed, 1. The introduction of formal spaces for receiving guests later came to be commonly termed as drawing rooms or spaces. This happened largely as a transformation of the Kola or irayam. 2. The introduction of larger exclusive bed rooms and bath rooms and toilets. The baths and toilets first introduced in the region as independent appurtenances slowly became part of the house mostly attached at the back of the house. The changes in occupations resulting in a growth of



monotony of the wall was treated by ornamentation and designs of fenestrations. New elements such as show wall, parapet fins, buttress walls etc started appearing. These new middleclass with new occupations or government jobs with developing social norms where guests of other castes are also received to the house required the introduction of formal drawing rooms, once considered a 'modern' requirement. So was the case of bath rooms.

The second half of twentieth century saw tremendous changes in the construction sector with changes in socio- economic conditions, out migration, exposure to other construction practices and changes in construction technology and materials. The major factor for change was the introduction of RCC as the material for roofing. There was flexibility in terms of the planning with respect to the roof. The role of thatchan (master carpenter was reduced to just production of joinery for door and window frames. The mason became the master. The wall became the prominent feature and the traditional sloping wooden roof with Mangalore Pattern tiles was replaced by RCC flat roof. For a while at least part of the house were made of RCC or Madras terrace, largely as thing of status value. Even then the general planning concept of the central segment with extending segments around was kept intact. The flexibility provided by the new material combined with the new needs of attaching toilets and private personal spaces lead to interesting extensions from the conventional plans.

Figure 8: spatial extensions to the single Aroodam house towards the side .The essential central space and the extensions (chayippu) to the sides is continued as seen

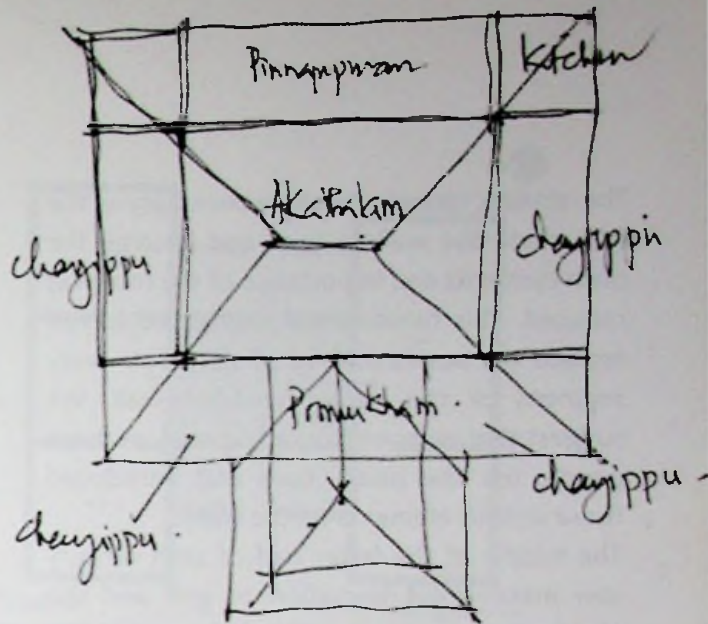
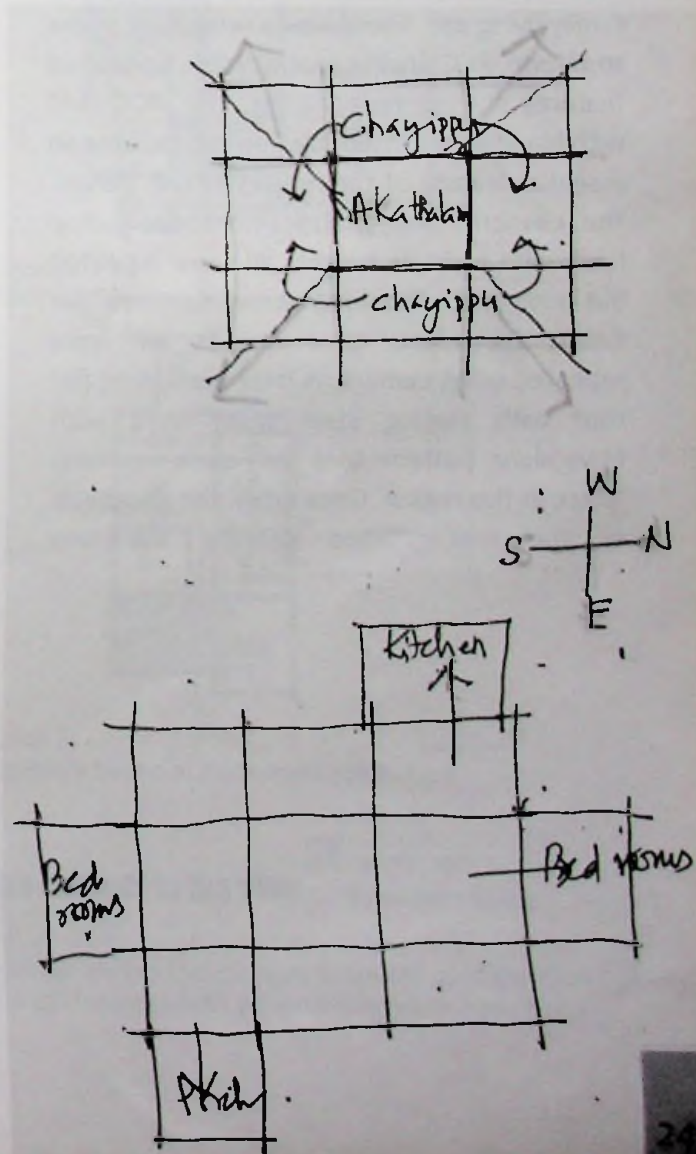


Figure 7: a schematic plan showing the spatial disposition of the segments in a single Aroodam house



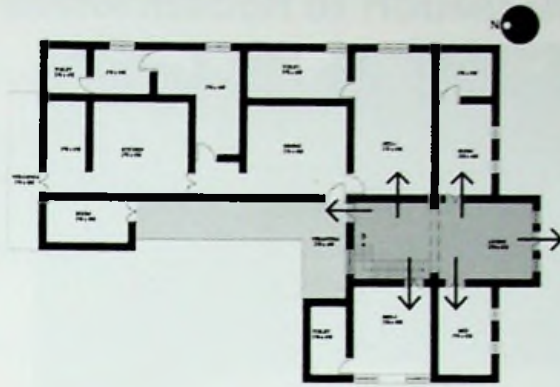
The stylistic changes became necessary as the RCC made the walls bare and became the main elements and importance of the roof was reduced. This fundamental change could not replace the aesthetic idea of details in every segment of the earlier wooden wall. We suggest that without the capping roof, perhaps people felt the house bare and introduced these stylistic elements on the walls.

The middle of the latter half of 20th century saw massive out migration to gulf and the Middle East and tremendous change in the socio-economic profile of the region. This added a number of spaces like pantry kitchen, pooja rooms, attached dressing spaces to bathrooms for each bedroom, office space, family living etc. There was a rethinking in the roof form. RCC sloping roof with the traditional features started reappearing. The RCC roof with Mangalore Pattern tiles on top became an essential feature of the houses of this period. The elements like gables (*monthayam*) and roofs with multiple heights all were repeated but with RCC. The ornamental features like finials, makudam, eave boards all were repeated using cement. A later version of flat roof with sloping steel truss work with Mangalore pattern tiles are seen in many places in the region. Once again the geometry of the roof started defining the two

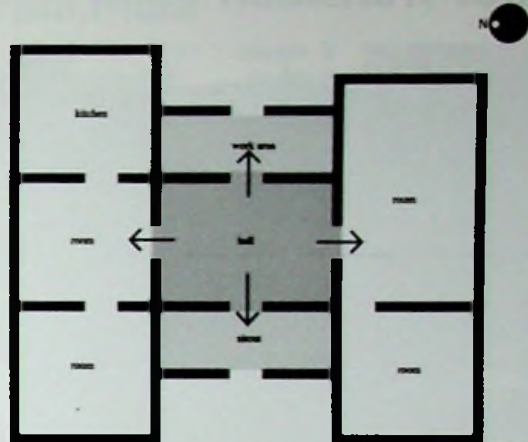
dimensional plan.

The second typical and advanced typology of the Kerala house is a courtyard type - Nalukettu. Depending on the size and importance of the household the building may have one or two upper storey or further enclosed courtyard by repetition of the nalukettu to form ettukettu or a cluster of such courtyards. Nalukettu is a combination of four halls along four cardinal directions, centred around the courtyard or *anganam* one may build any one of the four halls (*ekasala*), a combination of two (*dwisala*) or a complex of three (*thrisala*) depending on the needs. The most commonly found type in Kerala is the *ekasala* facing east or north. The core unit of *ekasala* consists of generally three rooms connected to a front passage. The central room is used as prayer room and grain store and the two side rooms are used as living rooms. The core unit may be raised to an upper storey with a steep stair located in the front passage. The building may also be extended horizontally on all the four sides adding side rooms for activities such as cooking, dining, additional sleeping rooms, front hall for receiving guests etc. The tharawads all ways remained as a house for feudal lords (*janmis*). This was a symbol of richness, where the masses followed the typology of single *aroodam* houses.

# Transformation of Plan Form



Case I  
Mamen Philip's house at HS Junction, Kollam



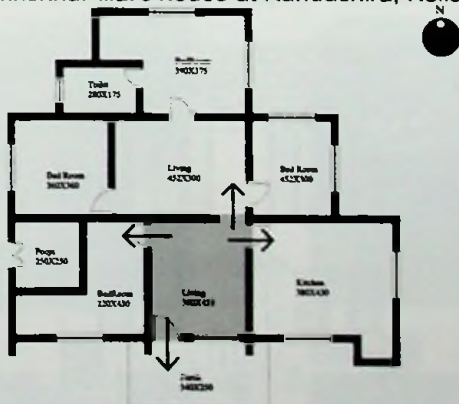
Case II  
Mohan Lal's house at 2nd mile stone, Kollam



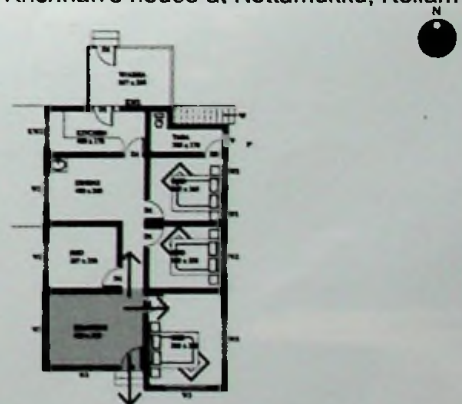
Case III  
Ramakrishna Pillai's house at Kandachira, Kollam



Case IV  
Radha Krishnan's house at Kottamukku, Kollam



Case V  
Parameswaran's house at Kottamukku, Kollam



Case VI  
Dr. Sasi's house at Kadappakkada, Kollam

## relative positioning of the central space with respect to the plan

central space  
subsidiary space

Figure 9: The case studies conducted at kollam region, kerala shows the changes in spatial configuration discussed. The concept of core and the periphery is seen in all the cases with variations in relative positions

# Roof Transition



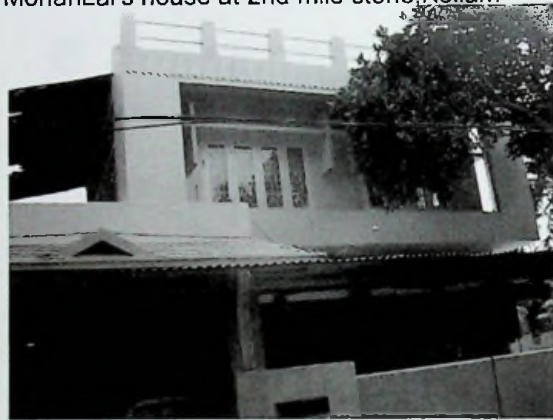
Case I  
Mamen Philip's house at HS Junction, Kollam



Case II  
Mohan Lal's house at 2nd mile stone, Kollam



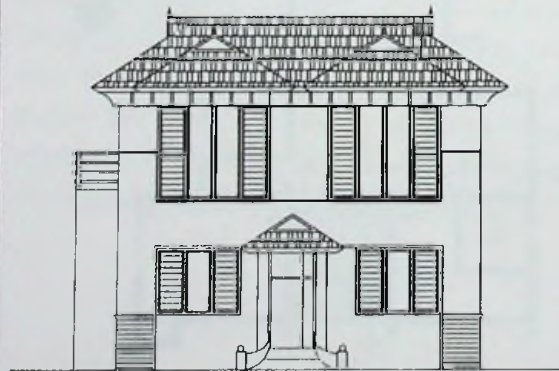
Case III  
Ramakrishna Pillai's house at Kandachira, Kollam



Case IV  
Radha Krishnan's house at Kottamukku, Kollam



Case V  
Parameswaran's house at Kottamukku, Kollam



Case VI  
Dr. Sasi's house at Kadappakkada, Kollam

**note the cyclic change of the vernacular elements from case-I (1950)-  
case-VI(2010)**

Figure 10: Case studies reveal the features which retains the original flavour and what features deviate away. Cases chosen from AD 1950 to AD 2010

# Transformation of Houses, Kerala, India

case- 1



case- 2



case- 3



case- 4



case- 5



case- 6



Figure 11: The following cases show the typological transformation occurred in various periods starting from 1950 to the present day. Case 1 represents the first shift from the traditional roof and case 2 and 3 represents the different typologies of sloping roof on the single Aroodam. In case 6 to case 9 the change from sloping roof to flat roof can be seen.

Figure 12: various Stages showing the transformations. The reappearance of the sloping roof can be seen from case 11 and continuing till case 17 in various forms

case- 7



case- 8



case- 9



case- 10



case- 11



case- 12



case- 13



case- 14



case- 15



case- 16



case- 17



case- 18



## Conclusion

The discussion above, point out to the way in which vernacular architecture (the way people build unselfconsciously) makes cyclical evolution. The changes in economy such as occupation pattern, incomes and their distribution etc., resource situation like land availability and easy availability of newer materials, the exposure to other cultures through various means resulting changes in living styles and patterns, changes in gender relations, development of nuclear households and social relations to be accommodated within the house and more importantly projection of houses and their architecture as symbols of status have made the evolution undergo a gradual yet significant shift and modification over time, yet trying to reinvent the roots reversing the trends and modifying it in the process.

The changes in plan configuration of the single aroodam middle class house occurred with reference to the change in the way people

started living with more socializing and requiring guests who are not relatives and also from different castes to be entertained or invited in the house. A new sense of privacy influenced the spaces. The *kola* or *irayam* extended further outward and became *poomukhom* and later into a drawing room. Similarly the separate bed rooms became important and toilets (once considered polluting ritually) also made demands. Kitchen also changed its function and style with mass cooking for agrarian houses going away and servants becoming rare to get. The changes were accommodated with marginal shifting of the spaces and yet within the parameters determined by the sloping roof - local joinery system. In terms of the architectural 'style' (to use a word in the absence of a better word), the sloping pyramidal tile roof still was the dominating element. Often covering more than half in some cases up to two third of the total height in elevation. The rain still influenced and manifested in the form of architecture.

Second wave of changes occurred with the advent of new material and technology like reinforced cement concrete. This changed the way plans could be accommodated. Yet the changes were not drastically different in its basic configuration. Drastic changes occurred only as deviance not as a rule and more because of professional involvement. Once the flat roof was a fashion statement, at least a portion in the front. The concrete flat roof suddenly changed accent from the roof to the wall. The mason became more important than the carpenter. The wall has to be treated and that reflected in the need for an 'elevation'. The standardization and restrictions imposed by the traditional wooden tiled roof vanished. This phase of advent of modern architecture in Kerala was also at a time of the rise of rationalism, objectivity and democratic evolution, an admiration for science and technology, and the value of an egalitarianism. The current and the third wave of changes is in a way a reaction to this and is being propelled by the urban middle class and the lamentation of going back to the 'original Kerala culture' and a rather invented 'Kerala Style'. Now the sloping tile roof has come back but with RCC base with tile being pasted on it. It is really a reappearance of the

mental image of the original being applied on to a contemporary technology. The form with the dominance of roof is being accepted as 'Kerala style'. The real estate market is also reacting to this by appropriating the sentiments. When the space configuration and technology changed, the search is on to a dominant element in form which gives an image of the past. The 'critical mass' in the popular sentiment, is the dominating roof of tiles, though produced by entirely different production process and often a different design process as well. There appears an amount of 'myth creation' in this process. Is it a reinvention of visual memory? Is it vernacular or designed vernacular? In that case vernacular only offers a visual image like a catalogue of forms. The diacritical mass then is determined by mere sentiments of the current fashion or is there something more basic in this process? In the evolutionary process, the formal parts of the society and economy such as market mechanisms, professional services (architects/building industry) and the sentiments of the people all are involved. The original images and visual memory also get transformed and perhaps a current vernacular evolving.

## Bibliography

Dr. A Achyuthan and Dr. T S Balagopala Prabhu, Architecture of traditional buildings- retrospect and prospect, an article in Stapathi journal (Apr-Sept 2003), Vastuvidya Prathishtanam, Calicut

Dr. A Achyuthan and Dr. T S Balagopala Prabhu, Architecture of traditional buildings- retrospect and prospect, an article in Stapathi journal (apr-sept 2003), Vastuvidya Prathishtanam, Calicut

Dr.Ashalatha thampuran,traditional Architectural Forms of Malabar coast,2001,Vasthu Vidya Prathishtanam,Calicut

Ashok Lall, Evolving traditional practices for sustainable construction in the present, New architecture and urbanism- development of Indian traditions, The NABHA foundation & INTBAU India

Gangadharan T K ,evolution of Kerala History and Culture, Calicut central University Calicut

Hemant Shah, Traditional architectural attributes in contemporary architecture, unpublished thesis-1988, CEPT University, Ahmedabad

Ar. Paul Varghese, The 'Nalukettu' of Kerala- an analytical approach, an article in Stapathi journal (apr-jun 1999), Vastuvidya Prathishtanam, Calicut

Raman Namboothiripad, Reasons for modification of residential buildings, an article in Stapathi journal (jan-jun 2001), Vastuvidya Prathishtanam, Calicut

aptarishi Sanyal, Contemporary relevance of traditional principles in architecture and urbanism, New architecture and urbanism- development of Indian traditions, The NABHA foundation & INTBAU India

Dr Sridhara Menon A, The legacy of kerala,2008,D C Books,Kottayam

Dr Sridhara menon A,Cultural Heritage of kerala,2008,DC Books

Is tradition green? Panel discussion- INTBAU India, New architecture and urbanism- development of Indian traditions, The NABHA foundation & INTBAU India

Tradition and contextual relevance for education in architecture and urbanism, Panel discussion- INTBAU India, New architecture and urbanism- development of Indian traditions, The NABHA foundation & INTBAU India