EXPLORING VERNACULAR ARCHITECTURE: UNRAVELLING CHARACTERISTICS AND TYPOLOGIES THROUGH EXPERT SURVEY

Fathima A. Linas*, K. Chithra*

*Department of Architecture and Planning, National Institute of Technology Calicut - Kozhikode, Kerala, India

Abstract

Vernacular architecture is termed an 'anonymous', 'spontaneous', 'rural'', and indigenous form of architecture and which is influenced by culture, geography, climate, and ethnic factors. However, defining 'vernacular' is always a difficult task as definitions have variations with respect to context and time. Although research has been conducted globally on vernacular architectural styles and their characteristics, defining a specific vernacular style remains challenging. This research attempts to define vernacular architecture using its characteristics through a comprehensive literature review, followed by an expert survey. The research also aims to delineate vernacular courtyard house typologies by identifying their distinguishing features. The survey was conducted among experts in the field of architecture and is used to define the characteristics of vernacular architecture, and validated the established vernacular courtyard residence categories in Kerala.

Keywords

Vernacular Architecture, Courtyard houses, Expert survey

1. Introduction

Vernacular architecture is a conventional approach that communities utilize to meet their housing needs. It is characterised by its simplicity and natural design, reflecting the cultural and environmental context in which it is built. Vernacular architecture is significant because it represents the core of a community's cultural identity (ICOMOS, 2002). Different architects and researchers have interpreted overnacular architecture differently. Indeed, the definition of vernacular architecture is not universally agreed upon (Maudlin and Brown 2012). Thus, it is essential to establish distinguishing features of vernacular architecture to clearly delineate vernacular architectural prototypes or to differentiate vernacular architecture from traditional architecture. Implementing vernacular techniques in contemporary architectural practices will advance environmentally conscious and energy-efficient design solutions (Sayigh, 2019). Vernacular architecture is an indisputable heritage resource that needs to be promoted and preserved. Architects define vernacular architecture differently; for example, 'architecture without architecture' (A. Rudofsky et al., 1964) and built to meet needs' (Oliver, 2006). Vellinga

emphasizes that regardless of the specific wording, there is a prevailing trend to use specificities. (Vellinga, 2011). According to Pardo, issues such as industrialisation and globalisation of modern construction techniques pose a serious threat to the continued existence of vernacular architecture in contemporary settings. The decline in the utilization of traditional buildings, which falls short of their original purposes or modern comfort standards, coupled with the pressure of urban development in highly populated regions and the occasional presence of restrictive regulations, poses a complex challenge for contemporary society (Pardo, 2023).

Vernacular architecture has different interpretations and criticisms, and many attempts have been made to extract features of vernacular into contemporary or modern architecture, especially 'sustainability' (Dulcie & Maran, 2018; Sayigh, 2019). The definitions or processes for defining vernacular architectural prototypes remain unclear and underexplored in the existing literature. The process for defining vernacular architectural prototypes Despite various interpretations of vernacular architecture, defining a specific vernacular architectural style appears to be challenging due to the lack of clarity in the process. The studies conducted thus far have

not provided a comprehensive explanation of the steps involved in defining the vernacular architectural style.

Identifying and defining vernacular architecture typologies worldwide can be challenging because of the difficulty in differentiating vernacular and traditional architectural typologies. Defining vernacular architecture will aid in addressing this issue. This study attempts to identify the characteristics of vernacular architectural typologies through a literature review. Subsequently, an expert survey was carried out to validate these characteristics, followed by a statistical analysis to determine their significance. Based on these characteristics, this study attempts to identify and characterize vernacular courtyard houses unique to Kerala, a state in India.

Kerala is a state in southern India blessed with a warm-humid climate and rains almost throughout the year. Open-to-sky courtyards within houses were found to be a passive design strategy unique to the region.

This study aims to define the vernacular courtyard residential typologies of Kerala by validating the identified prototypes using the identified characteristics of vernacular architecture through an expert survey. The methodology comprises a preliminary literature review, followed by an expert survey. Four courtyard residential typologies were identified as the final outcomes of the research. The detailed methodology is discussed in Section 2.

2. Materials and Methods

The research design included literature review and questionnaire survey. Fig.1 shows the detailed flowchart of the methodology used in this research. A comprehensive literature review was conducted to define the characteristics of vernacular architecture and to identify the courtyard house typologies of Kerala. In the next stage, a questionnaire survey of experts was conducted to rank the importance of the identified characteristics of vernacular architecture and to rank the identified residential prototypes.

The questionnaire comprised of three sections, first section was designed to collect the details of the experts, section two for the the ranking of the identified characteristics of vernacular architecture.
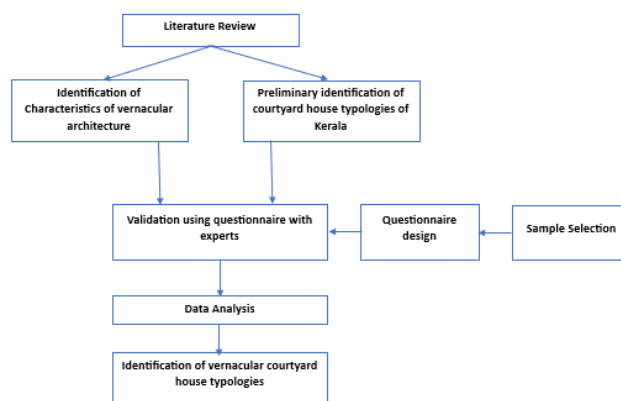

Fig. 1: Research Methodology

The final section of the questionnaire was designed to evaluate vernacular prototypes based on the characteristics of vernacular architecture outlined in Section 2. A weightage score was calculated for each vernacular prototype, and the lowest-scoring typologies were eliminated, resulting in the final list of vernacular courtyard house typologies for Kerala.

2.1 Identification of characteristics of vernacular architecture

A comprehensive literature review was undertaken to identify and delineate the salient features of vernacular architecture (Tab.1). The following characteristics were identified.

1. Vernacular architecture represents a substantial part of cultural heritage.

Vernacular architecture represents a particular region or community's traditions, customs, and values, reflecting the history, lifestyle, and artistic expressions of the people who have built and inhabited these structures over generations. The conservation of vernacular architecture ensures a continuum in heritage fabric (Abdurahiman et al., 2022; AL-Mohannadi et al., 2020). Cultural heritage values form an inseparable whole together with tangible and intangible data(UNESCO, 2003). Vernacular and traditional architecture, which form an important part of tangible cultural heritage, also bears traces of intangible cultural heritage. It is important to protect historical settlements that contain architectural data within the general structure that constitutes their living spaces and to transfer these settlements to other generations in the context of sustainability (Nihal Arda Akyildiz &

Tuba Nur Olgun, 2020). Vernacular architecture originates within a community, and each vernacular building can be considered an ethnic representation of the respective community.

2. Vernacular architecture is linked to the customs and social structure of a region.

Vernacular architecture, rooted in the traditions and customs of a specific region, is intimately linked to the ways of life and social structure of the community it serves. This reflects the cultural, social, and economic realities of the local population, shaping the built environment in harmony with their needs, values, and social interactions. Vernacular architecture is built by people, and their design decisions are influenced by the traditions of their culture, which have been gathered through a long period of trial and error (Zhai & Previtali, 2010) (Rudofsky, 1964). Vernacular architecture contains solutions that best meet the spatial requirements and is confronted with many qualities that are unique to works of art shaped by the masters of the building (Nihal Arda Akyildiz & Tuba Nur Olgun, 2020). Michel Brawne (2003) emphasized that vernacular buildings are not merely physical structures, but also social artifacts that reflect social hierarchies, family dynamics, and societal and communal relationships (Brawne, 2003).

3. Vernacular architecture is adapted to the natural conditions of a territory.

Rajokovik and Bojovic demonstrated that vernacular and traditional architecture harmonize with nature, creating a balanced and environmentally conscious way of life. They emphasize attitudes toward climatic and topographical realities and the spirit of place (genius loci). This architectural approach represents a response to the natural conditions of the location where architecture originates (Rajković and Bojović, 2016). Similarly, Bernard Rudofsky (1964) explained the adaptability of vernacular architecture to its natural surroundings (Creangă et al., 2010; Rudofsky, 1964). According to Oliver, vernacular architecture is related to its environmental context and available resources; it is customarily owner- or community-built, utilizing traditional technologies. All forms of vernacular architecture are built to meet specific needs and accommodate the values, economies, and ways of living of the cultures that produce them (Oliver 2006). Bodach et al. explain climate responsiveness as one of the ways in which vernacular buildings adapt to

natural conditions. Passive design strategies can help achieve thermal comfort in vernacular buildings (Bodach et al. 2014).

4. Vernacular architecture is sustainable.

Vernacular architecture has developed in particular regions in response to environmental and cultural influences. This reflects the identity of a region. Vernacular architecture is a distinctive feature of each region of the world as it is consistently adapted to respond to climate, topography, local resources, and social customs (Salman, 2018). Salman says that vernacular architecture is a demonstration of identity and sustainability, and he describes vernacular architecture as a "mirror" of nations that can reflect place, time, and culture (Salman, 2018). Nguyen (2019) stated that vernacular architecture is a proven model of sustainable architecture. By utilizing locally accessible materials, conventional construction methods, and adaptive design strategies, this style of architecture, which is rooted in regional customs and practices, produces structures that blend in with their surroundings and sustainably meet the needs of the local population. Vernacular architectures often incorporate passive cooling techniques to mitigate the need for artificial cooling systems. (Nguyen et al., 2019a).

5. Vernacular architecture generates cultural landscapes.

One of the most significant features of vernacular architecture is its intimate integration with the landscape environment. The Landscape Convention (*European Landscape Convention*, 2000) defines landscape as an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. According to Kovács (2020), the cultural landscape creates an unbalanced relationship between built environments and the surroundings (Kovács, 2020). Revaluing vernacular architecture is crucial because it is the basis of private everyday life, with a strong connection to the landscape. This landscape has great cultural and environmental significance because it shows how our ancestors gradually constructed and understood a complicated world. Therefore, the first step toward preservation and future recommendations is to identify, investigate, understand, and categorize (Ennals & Holdsworth, 1981; Sáez & Canziani, 2020).

6. Vernacular architecture was dynamic.

Vernacular architecture is dynamic and constantly changing in order to meet new demands and circumstances. A certain region or community built environment reflects its unique culture, environment, and socioeconomic considerations. Vernacular architecture is adaptable and sensitive, expressing the spirit of creativity and adaptation, as opposed to monolithic architectural styles that may last for centuries. The strong connection between vernacular architecture and the local environment is one of the main factors contributing to its dynamic nature. It considers the local environment, including geography, climate, and natural resources (Oliver, 2007). A vernacular design may respond to environmental concerns successfully because of its relationship with nature. For instance, in earthquake-prone areas, vernacular architecture may use adaptable construction methods and materials (Brawne 2003). According to Fakhr Al-Deen, vernacular architecture involves constructing buildings spontaneously and cumulatively over time in an environment. It uses available technologies and resources as a type of real responsibility for the physical and spiritual needs of users (Salih, 2019). According to Nihal Arda Akyildiz and Tuba Nur Olgun (2020), vernacular architecture offers the best solution for accommodating spatial needs. It also has multiple features which render it distinctive as works of art created by the architects (Nihal Arda Akyildiz & Tuba Nur Olgun, 2020)

7. Vernacular architecture generally has no specific or individual authorship.

Vernacular is one that naturally develops from a particular area or community. It does not have a single author or designer; rather, it develops because of the shared wisdom and experience. It reflects the local culture, climate, and resources while also evolving over time. Vernacular architecture, which highlights the inventiveness and skills of both previous and present generations, represents the sustainability, community, and creative spirit of a people. Bernard Rudofsky called vernacular architecture 'Architecture without architects', defining the character 'no specific authorship' (B. Rudofsky, 1964). Local builders have used these pioneering types as models when determining building types and, consequently, the characteristics of traditional architecture. They applied the process using the draft composition that already existed in their minds, and eventually built places and

structures by realising local cultural practices and narratives (Bakırer, 2018, 175). Vernacular Architecture is built by people, developed over time, and modified through trial and error to fulfil the needs of users in harmony with the environment (Salman, 2018).

8. Vernacular Architecture uses the traditional construction techniques.

Oliver (2007) defined vernacular architecture as the ability to construct a structure during prehistoric times confined by the availability of materials and resources (Oliver, 2007). According to Agyekum et al., vernacular building materials and construction methods offer specific qualities and characteristics that make them viable contributors to the delivery of sustainable housing. (Agyekum et al., 2020). Dependence on locally accessible resources is one of the main justifications for the use of traditional construction methods in vernacular architecture. Vernacular structures are frequently made from nearby materials, such as clay, stone, wood, thatch, or bamboo. These materials are eco-friendly, renewable, reusable, and contain embodied energy (Salman 2018). The vernacular design minimizes the need for long-distance transportation using local resources. Pardo discusses that even though the vernacular architecture of vast extents of the earth remains unexplored, certain regions are currently experiencing a revival of interest in vernacular architecture and the use of locally produced renewable materials in contemporary construction (Pardo, 2023). Considerable research has been conducted on vernacular materials, construction techniques, and their application in contemporary architecture. In particular, the construction of mud, cobs, and bamboo (Parracha et al. 2021).

2.2 Preliminary identification of vernacular courtyard house typologies of Kerala

Vernacular courtyard house typologies were identified through a thorough examination of the literature and interviews with experts in traditional Kerala architecture. Widiastuiti's research acknowledges that Kerala boasts a multitude of courtyard house variations, with many diverging from the strict principles of Vaastu, thereby falling under the category of local variations in the *nalukett* style. According to Widiastuti (2013), the courtyard house typologies

found in Kerala include *mana/illam*, Nair tharavad, Syrian Christian house, and Muslim tharavad houses of Ponnani and Kozhikode. Thampuran expanded this list by introducing *agraharams* as a specific category within the realm of courtyard houses(Thampuran, 2001). A primary list was extracted from the relevant literature sources and supplemented by discussions with experts.

Tab. 1: Characteristics of vernacular architecture- Literature review

	Characteristics of vernacular architecture	**Literature**
1	Vernacular architecture represents a substantial part of cultural heritage.	(Nihal Arda Akyildiz & Tuba Nur Olgun, 2020) (Abdurahiman et al., 2022)(ICOMOS, 2002) (AL-Mohannadi, Furlan, & Major, 2020)(Pardo, 2023)(UNESCO, 2003)
2	Vernacular architecture is tied to the ways of life and social structure of a region.	(Zhai & Previtali, 2010),(Brawne, 2003) (B. Rudofsky, 1964).(Donovan & Gkartzios, 2014)
3	Vernacular architecture is adapted to the natural conditions of a territory.	(Creangă, Ciotoiu, Gheorghiu, & Nash, 2010a; Paul Oliver, 2006),(Rajković & Bojović, 2016),(B. Rudofsky, 1964)(Pardo, 2023)
4	Vernacular Architecture is sustainable.	(Dulcie & Maran, 2018; Fernandes et al., 2015; Jahanara et al., 2014; Jayan, 2018; Nguyen et al., 2019; Nihal Arda Akyildiz & Tuba Nur Olgun, 2020; Salman, n.d.; Sayigh, 2019),
5	Vernacular architecture generates cultural landscapes.	(Ennals & Holdsworth, 1981) (Sáez & Canziani, 2020)(Kovács, 2020)(*European Landscape Convention*, 2000)
6	Vernacular architecture was dynamic.	(Salih, 2019),(Nihal Arda Akyildiz & Tuba Nur Olgun, 2020; Pardo, 2023)
7	Vernacular architecture generally has no specific or individual authorship	(B. Rudofsky, 1964)(Salman, 2018)(Creangă, Ciotoiu, Gheorghiu, & Nash, 2010b; A. Rudofsky, Doubleday, & City, 1964)
8	Vernacular Architecture uses traditional construction techniques	(Agyekum, Kissi, & Danku, 2020; Fernandes et al., 2015; Oliver, 2007; Pardo, 2023; Parracha, Lima, Freire, Ferreira, & Faria, 2021; Salih, 2019; Vural, Vural, Engin, & Reşat Sümerkan, 2007; Widiastuti, 2018)

The preliminary list is as follows:
1. *Mana/illam*
2. *Nair tharavad(chathussala typology)*
3. *Malika* houses of Ponnani
4. *Malika* houses of Kuttichira
5. *Agraharams*
6. Syrian Christian courtyard houses

2.3 Validation using a Questionnaire survey with experts

A questionnaire survey was conducted to verify the attributes of vernacular architecture and to establish a definitive list of courtyard house typologies in Kerala. Theoretical validity is typically evaluated using a questionnaire survey administered by a panel of experts(Bhattacherjee, 2012; Elangovan & Sundaravel, 2021).

Twenty experts were contacted based on their expertise and familiarity with traditional Kerala architecture. Structured individual interviews are more time-consuming and possibly more expensive to use in surveys. However, questionnaires continue to be the most popular method for conducting surveys and are undoubtedly one of the most widely used research instruments in the social sciences, if not the most widely used (Fife-Schaw, 1995). Using the average index technique (Majid & McCaffer, 1997), the respondent data were processed and a weighting score was assigned to the criteria and sub-criteria to create a hierarchical structure for the proposed framework.

2.3.1 Questionnaire Design and Survey

The questionnaire was designed to assess experts' perspectives on vernacular architecture and identify Kerala's vernacular courtyard houses. The questionnaire was structured into four sections. Part 1 of the questionnaire collected the experts' basic details, qualifications, and experience. Part 2 describes the basic intention of the questionnaire and the objectives of the survey and research. Part 3 of the survey briefly describes vernacular architecture, and experts were asked to rank the characteristics of vernacular architecture based on their perceptions. The experts were asked to rate the identified characteristics of vernacular architecture according to their judgement criteria on a seven-point scale ranging from extremely high to extremely low importance. Part 4 of the survey evaluated the identified

vernacular courtyard typologies of Kerala using the identified characteristics of the vernacular architecture. Experts were asked to place a tick mark on the suitable characteristics of each residential type.

A pilot survey was conducted to validate the questionnaire, and necessary changes were made.
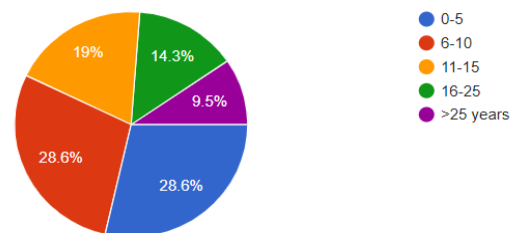
Subsequently, an online questionnaire was created using Google Forms and circulated among the selected twenty experts. Data collection was conducted among experts who were familiar with the chosen courtyard residence typologies and had prior knowledge of them. Fig.2 shows the qualifications and experiences of the experts.
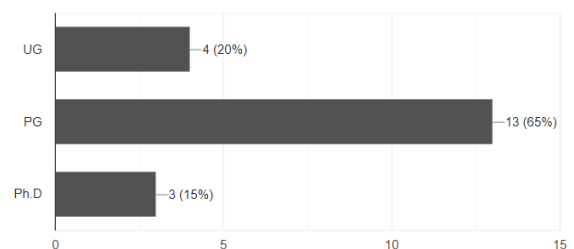
Fig. 2: Educational Qualification and Work Experience of the Experts

All experts were Architects had five to ten years of experience. Of the experts, 65% had a postgraduate degree in Architecture.

2.3.2 Data Analysis

The collected data were analyzed using frequency analysis. A Likert scale was used in the questionnaire to capture the necessary data, as it proved to be particularly valuable in social science and attitude research projects (Croasmun, 2011). Part 3 of the questionnaire collected experts' perceptions of vernacular architecture using a seven-point Likert scale, as given in Tab.2. A seven-point Likert scale was used to ensure that optimum reliability was available within the scale.

The average index value for each criterion in part 2 was calculated using the following formula:

$$\text{Average Index, } AI = \frac{n\sum (wi \; X \; ni)}{N.}$$

Where '*wi*' is the weight experts give for each statement and the frequency of the corresponding response, and 'N 'represents the total number of experts.

Tab. 2: Likert scale and levels of agreement

1	**Extremely low importance**
2	Very low importance
3	Low importance
4	Moderate importance
5	High importance
6	Very high importance
7	Extremely high importance

Part 4 of the questionnaire identified vernacular courtyard house typologies specific to Kerala and evaluated the identified vernacular residential courtyard typologies with respect to the factors specified in Part 3.

The weightage score for each vernacular courtyard residential typology was determined based on the Average Index score calculated from Part 3 of the questionnaire. Vernacular residential typologies which secured low score were not considered for further analysis.

3. Results

Among the experts, 20% were architecture graduates, 65% were postgraduates, and 15% had a doctoral degree in Architecture.

The level of agreement for each of the characteristics of the vernacular architecture was interpreted by calculating the Average Index (AI). Tab.3 shows the Average Index for each of the identified characteristics of the vernacular architecture.

In part 3 of the questionnaire, experts evaluated vernacular courtyard residential typologies with respect to the identified characteristics of vernacular architecture.

Tab.4 lists the scores obtained for each vernacular courtyard house typology. *Mana/illam*, *Agraharam* and *Nair tharavad* received higher points for the first characteristic: vernacular

architecture represents a substantial part of cultural heritage. The survey results indicate that the second characteristic is more applicable to *Nair Tharavad* and *Agraharams*, whereas the third characteristic is more valid for *mana*, *illam*, and *Nair Tharavad*. The survey showed that the sustainability of vernacular architecture was more accurate in the case of *Nair Tharavad*.

In addition, the *agraharams* received more points in the fifth characteristic: the vernacular architecture was dynamic.

Tab.3. Average Index for each characteristic of vernacular architecture

Charact. No	Characteristics of Vernacular Architecture	Calculated AI
C1	Vernacular Architecture represents a substantial part of Cultural Heritage	6.55
C2	Vernacular Architecture is tied to the lifestyle and social structure of a region	6.55
C3	Vernacular Architecture adapts to the natural conditions of the territory(Construction uses local materials- and corresponds to a specific climate)	6.8
C4	Vernacular Architecture is sustainable	6.25
C5	Vernacular Architecture generates cultural landscapes	6.35
C6	Vernacular Architecture was dynamic.	5.65
C7	Vernacular Architecture generally has no specific or individual authorship	5.9
C8	Vernacular Architecture uses traditional construction techniques	6.4

Based on the average index in Tab.3, the total weight for each vernacular courtyard house typology was determined considering the individual weightage of statements (Tab.5).

The total weight of each vernacular courtyard house was determined. *Agraharam* and *Nair Tharavad* obtained maximum total scores.

A Pareto chart is prepared using the total weights listed in Tab. 5.

The X-axis of the chart represents the vernacular courtyard house typologies, and the y-axis represents the total weight (Fig. 3). Vernacular courtyard house typologies with a total weightage of less than 80% were rejected and arrived at the final list of vernacular courtyard house typologies.
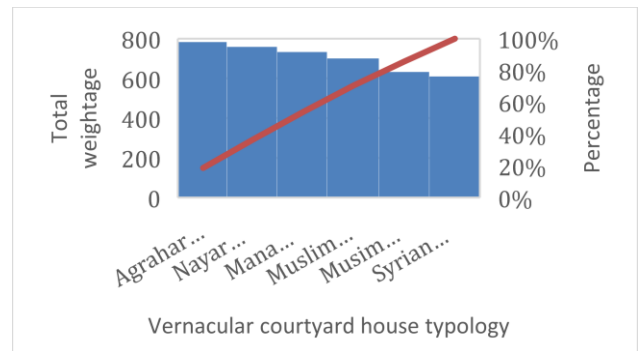

Fig. 3:. Pareto Chart

Tab.4: Total score for each vernacular courtyard house typology(Part 3 of the questionnaire)

	Mana/Illam	*Nair tharavad*	*Agraharam*	*Malika houses of Ponnani*	*Malika houses of Kuttichira*	**Syrian Christian houses**
C1	17	16	17	13	13	13
C2	11	12	12	10	9	9
C3	17	17	14	14	13	9
C4	16	19	16	16	14	15
C5	13	14	18	16	14	12
C6	14	14	13	12	11	13
C7	13	11	16	12	11	11
C8	15	17	18	18	15	15

4. Discussion

The results strongly indicate that most experts define vernacular architecture as a distinct architectural style, emphasising the utilisation of locally available materials. Furthermore, the significance of cultural heritage and lifestyle has emerged as the second-most important aspect of vernacular architecture. The use of traditional constructional techniques in vernacular architecture is also recognised as an important characteristic of vernacular architecture.

In the second part of the questionnaire survey, the identified vernacular courtyard residence typologies were assessed against the defining characteristics of vernacular architecture. Weightage was assigned based on the average index value. Fig. 4 presents the scores achieved by each vernacular courtyard house prototype for each criterion score achieved by each vernacular courtyard house prototype for each criterion.

Based on the total value, *Agraharam*, *Nair Tharavad*, *Mana/Illams*, and *Malika* houses of Ponnani were identified as suitable prototypes that follow vernacular architecture.

The details of vernacular courtyard houses are provided below.

a) *Agraharam*

Row houses are one or two stories tall, with a distinctive pitched roof cutting an impressive figure against the skyv (Thampuran, 2001). The courtyard typology among Agraharam is termed '*muzhumana.'*

The *agraharams* were introverted settlements, often open to the members of a particular caste group; however, within the introverted settlement, there were designs built and open spaces that catered well to the needs of the settlers. A typical Agraharam consists of *akamthinna* (stair room), *puram thinna* (outer verandah with platform), *rezhi* (central room), *thalam* (space around a courtyard), *kuchil* (ladies room), *machil* (attic room), and kitchen (Dulcie & Maran, 2018) (Sunder, 2011).
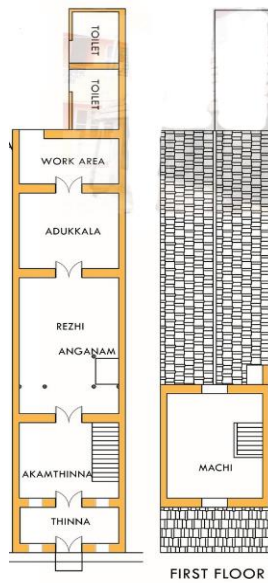
Fig. 5 shows the form and layout of a typical Agraharam.

Tab. 5: Total calculated weightage for vernacular courtyard house typology

	Mana/Illam	*Nair tharavad*	*Agraharam*	*Malika houses of Ponnani*	*Malika houses of Kuttichira*	Syrian Christian houses
C1	111.35	104.8	111.35	85.15	85.15	85.15
C2	72.05	78.6	78.6	65.5	58.95	58.95
C3	115.6	115.6	95.2	95.2	88.4	61.2
C4	100	118.75	100	100	87.5	93.75
C5	82.55	88.9	114.3	101.6	88.9	76.2
C6	73.45	88.9	114.3	101.6	88.9	76.2
C7	82.6	79.1	73.45	67.8	62.15	73.45
C8	96	108.8	115.2	115.2	96	96
Total	733.6	759.45	782.5	701.25	631.95	609.6
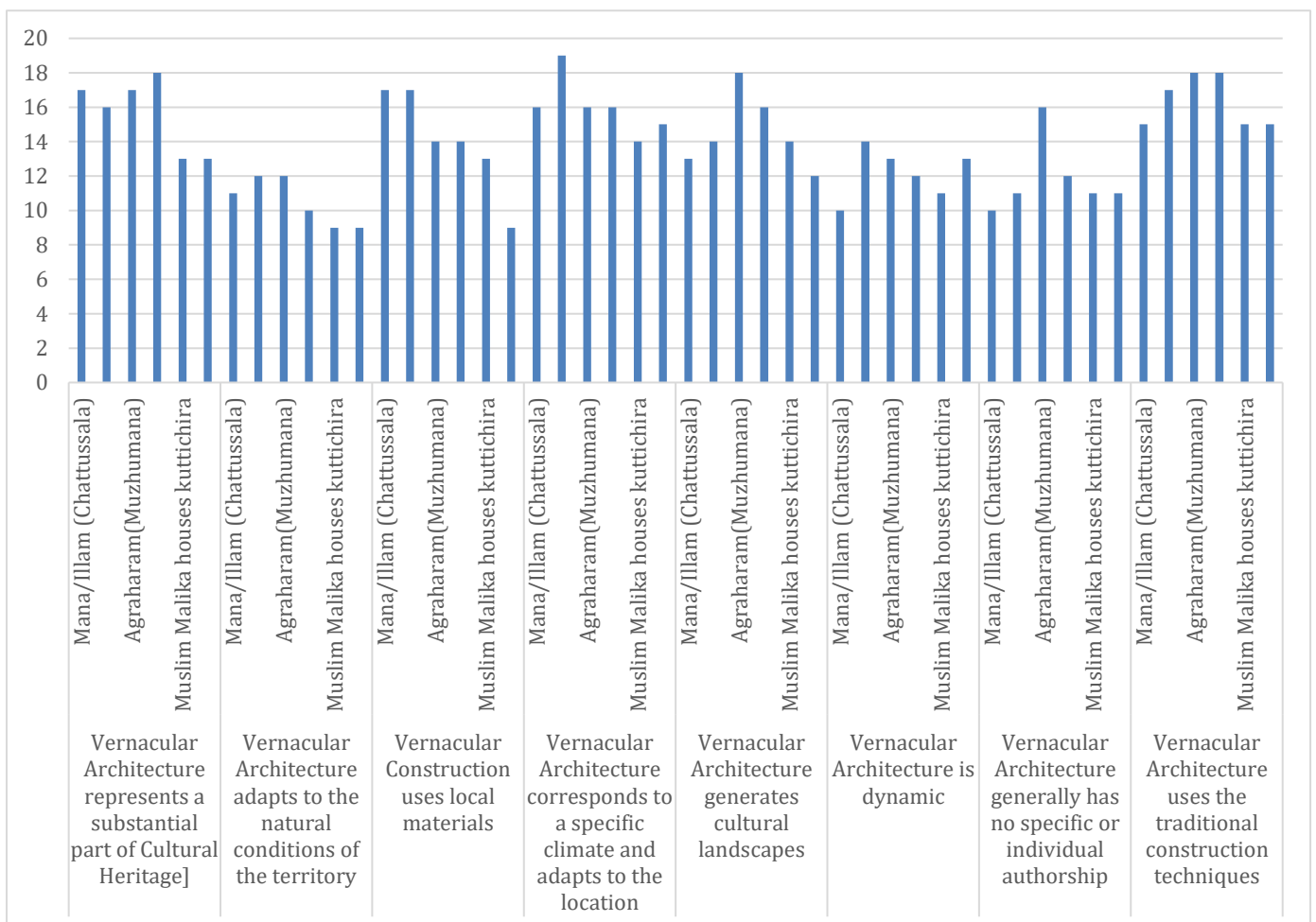
Fig. 4: The scores achieved by each vernacular courtyard house prototype for each criterion score
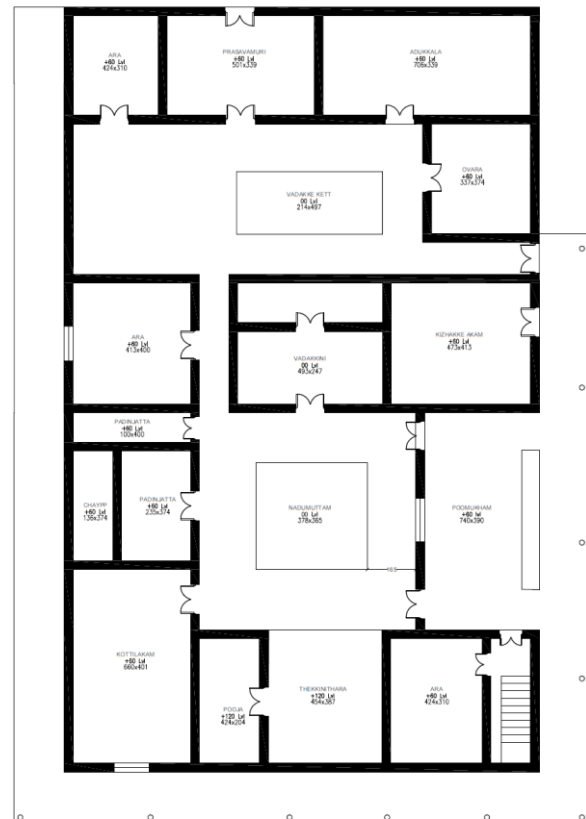
Fig. 5: The form and layout of a typical *agraharam* (https://peopleofindia1868-1875photos.blogspot.com/2010/08/agraharams-name-literally-means-garland.html)

Fig. 6: Plan of a *Nair tharavad* (Kalyad tharavad, Kannur)

b) *Nair tharavad*

Nair community of Kerala Hindus were mainly landlords and one of the dominant castes. They follow the matrilineal system of inheritance. *Nair tharavad* is the residential prototype of the Nair community. The courtyard house typology of *Nair tharavad* is called '*Nalukett*' house. A *Nalukett* house is characterized by its spacious layout, with a number of rooms to accommodate an extended joint family. The layout of '*Nalukett*' has certain regional variations across Kerala (Moore 2018). Figure 6 shows the plan for a *Nair Tharavad* in the Kannur District.

The *Nair Tharavad* consists of a prayer room (pooja muri), *ara*(bedrooms), kitchen, *kizhakkini* (dining space), etc. The scale of the house increases with the number of courtyards. The layout of a *Nair Tharavad* is similar to that of a mana, but the major difference between them is that *the Nair Tharavad* consists of more habitable rooms/bedrooms (Desai, 2018).

The number of bedrooms was based on the number of female members in the household, as they followed a matrilineal inheritance system.
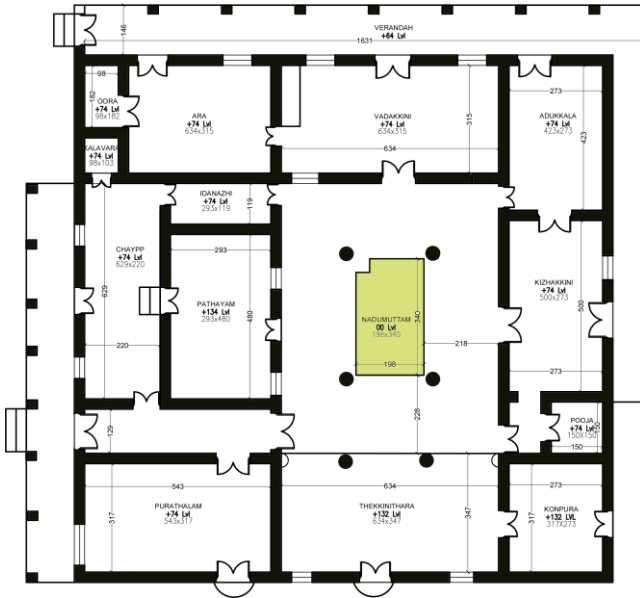
c)*Mana/illam*

Mana/illam is the residential typology of Namboothiri Brahmins in Kerala, who are generally scholars, Ayurveda practitioners, or Vedic exponents. The Namboothiri community is rooted in sixty-four Namboothiri gramams across Kerala. They follow the patrilineal inheritance system.

The *Mana/illams* contained one to four courtyards according to the scale of the house. Schildt called these prototypes' as ritualistic homesteads of Kerala', ' since each space of the house is related to some ritual of Brahmin life (Schildt, 2012) (Jacob et al., 1997; Schildt, 2012). *Mana/illam* and *Nair tharavad* have similarities in layout and structure, but they differ concerning the culture of the community.

The Fig.7 shows the plan of a *mana/illam* in Kannur.

Fig. 7: Plan of a *mana/illam* (Nagancheri mana, Perumbavoor)

d) *Malika* houses of Ponnani

Ponnani was the knowledge centre of Islam in ancient Malabar. A settlement with many mansions still exists in Ponnani in and around the old Ponnani Jumath Mosque. Ponnani Muslims follow a matrilineal system of inheritance by tracing their descendants from female members. The architectural character of Ponnani Muslim houses is distinct by the presence of multiple courtyards.

These courtyards serve as central hubs around which bedrooms, each with their private spaces, are arranged. This design philosophy is markedly introverted, standing in stark contrast to the architectural conventions observed in *mana/illam* and *nair tharavad* structures (Fathima, 2018).

Fig. 8 shows a plan for the Muslim house of Ponnani.

The four identified vernacular courtyard residence typologies exhibit distinct plan variations influenced by the user's culture and geographical region despite sharing commonalities in construction techniques, materials, and structural forms.

Exploring vernacular heritage through the lenses of both inhabitants and experts offers a comprehensive understanding that transcends academic boundaries. Scholars tend to offer theoretical frameworks that are well-organized, but the unique experiences and interpretations of local residents often provide valuable insights that

may contradict or enhance these academic viewpoints. Future research should prioritize qualitative interviews with community members and capture their definitions of and sentiments towards vernacular heritage. Comparing the perspectives of local communities with academic research can help to identify gaps, overlaps, and potential opportunities for collaborative efforts to preserve heritage. This approach can promote a comprehensive understanding of vernacular heritage, which is both intellectually sound and grounded in the specific context of each community.
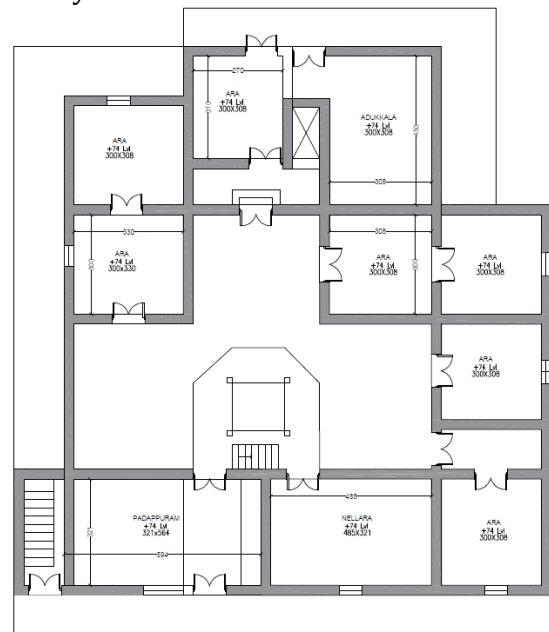
Fig. 8: Plan of a *Ponnani Malika house(Bareesoudh,Ponnani)*

5. Conclusion

Vernacular architecture is an amalgam of vernacular construction techniques, user culture, and site-defined characteristics. The anonymity and indigenous nature of vernacular architecture have been defined by different researchers worldwide as major characteristics of vernacular architecture. This study identified the characteristics of vernacular architecture through a literature review, and the average index for each character was determined using an expert survey. The survey results show the 'adaptability' of vernacular architecture as the most weighed characteristic, which includes adapting vernacular architecture to the site's natural conditions. The relationship between vernacular architecture and cultural heritage, lifestyle, and social structure is the second most weighted factor. The use of

traditional constructional techniques is also an important characteristic of vernacular architecture. The generation of cultural landscapes related to built forms in vernacular architecture is defined as the fourth character, and the sustainability of vernacular architecture as the fifth character. Anonymity or lack of proper authorship was identified as the sixth characteristic, and the dynamic nature of vernacular architecture had the lowest average index.

Experts evaluated the vernacular courtyard residence typologies using the identified characteristics and their average index. Vernacular prototypes that scored less in the Pareto chart were eliminated, resulting in a final list comprising the following vernacular courtyard residential typologies.
1) *Mana/illam,* 2) *Nair tharavad,* 3) *Agraharam,* 4) *Malika* houses of Ponnani

Residence typologies may have similarities in structure and materials, but differ in their plans, functions, and characters. The common factor may be the 'courtyard' alone, but the courtyard's size, activity and style were also found to be different in each typology. When the layout of *Mana/Illam* is entirely based on the ritualistic lifestyle of *Nampoothiris, Malika* houses of Ponnani give importance to privacy for females. However, all these built forms are slope-roofed or built with locally available materials specific to Kerala.

Vernacular architecture is an expression of a community's cultural, social, economic, and environmental conditions and is adaptive to the natural territory and setting. Further research on vernacular architectural typologies will help create sustainable built forms, even in the contemporary architectural world. Pellentesque tristique massa eu magna viverra et elementum lacus placerat.

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