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Critical evaluation of socio-cultural and climatic aspects in a traditional community: a case study of Pillayarpalayam weavers' cluster, Kanchipuram

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Abstract

Protecting vernacular architecture is important because it reflects a treasure-trove of local information, including climate responses, functions and the socio-cultural context. This study aimed to assess and evaluate the spatial and climate response features of the vernacular weavers' settlement in Pillayarpalayam, Kanchipuram, Tamil Nadu. This precinct, delineated as a heritage zone under the National Heritage City Development and Augmentation Yojana scheme by the Government of India, consists of a large number of traditional weavers' residences that have cultural and social significance. The methodology comprised primary documentation and unstructured interviews to assess the architectural and anthropological development of the settlement. The study and analysis were conducted at three levels—dwelling, cluster and street. Spatial analysis was carried out to understand the relationship between different weaving activities and their physical setting. Analysis of building materials and construction techniques was carried out to understand the climate response features. The traditional dwellings accommodated the spaces for the weavers to live, as well as functioning as a workspace. It was observed that many houses had undergone alterations to adapt to family needs while some houses had been demolished and replaced by concrete structures. The traditional craft of weaving was losing its importance and only few weavers in this cluster had retained the traditional living and working space. These vernacular dwellings need to be preserved because they represent a unique typology and are evidence of traditional knowledge and culture. Guidelines and recommendations have been proposed to conserve the intangible values such as culture, lifestyles, social factors, and production methods, in addition to conserving the vernacular built heritage and workspaces of this traditional and unique craft industry.

Keywords: Climate response, Culture, Heritage, Vernacular architecture, Weavers' dwelling

1 Introduction

'The built vernacular heritage is important; it is the fundamental expression of the culture of a community, of its relationship with its territory and, at the same time, the expression of the world's cultural diversity. It is a

continuing process including necessary changes and continuous adaptation as a response to social and environmental constraints' (ICOMOS 1999). Built heritage is characteristic of various communities and contexts, and reflects the response of a particular community to its respective climate, customs, lifestyles, materials and socio-economic structure through the planning and organisation of open, semi-open and enclosed spaces. The vernacular architecture of weavers' communities represents one such unique architectural typology, where the built environment is shaped by their craft

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and its associated activities. The spatial organisation in these vernacular houses corresponds to traditional lifestyles, accommodating both the social culture of the area as well as the work culture of weaving. The strong interconnectedness between the tangible heritage of weavers (their homes, cluster settlements, and materials) and their intangible heritage (production relationships, modes of intergenerational transmission of knowledge, skills and inspiration) is often ignored, which largely explains the decline of the handloom industry (Bagchee 2018).

Kanchipuram, the city of one thousand temples, is a historic town in southern India that has a vibrant history and rich culture. This cultural fabric is based on the interactions and interdependencies between its temples, crafts and communities. Silk saree weaving is one of the traditional crafts that the city is famous for. Despite its significance, however, this traditional craft is losing its importance owing to factors such as the lack of proper infrastructure, the dilapidated condition of the weavers' residences, low wages and the emergence of power looms. Only a few weavers' clusters and traditional weavers' residences now remain in Kanchipuram. The masterplan of Kanchipuram delineates four historic temples as heritage zones for conservation. (Abha Narain Lambah Associates 2015). However, it does not consider the broader context of the traditional vernacular settlements for conservation. This paper draws attention to the need for conservation of the traditional weavers' clusters in Kanchipuram, through an analysis of its built heritage and its underlying issues.

Vernacular heritage has a different set of conservation objectives compared with monumental heritage. It requires a thorough study of the context, capacity and challenges of the community. 'Moreover, the continuity of vernacular building and tradition requires continuous change and adaptation with regard to the future' (Chapagain 2008). Del et al., (2020) noted that holistic conservation of architectural heritage requires joint cooperation between people, experts and the government and it is important to analyse and prioritise semantic values for conservation, including cultural, economic and historical values.

The Declaration of Amsterdam, 1975 states that 'The architectural heritage will survive only if it is appreciated by the public and in particular by the younger generation.' For example, a study conducted by Var and Kobayashi (2019) aimed to conserve the rural areas of Trabzon, Turkey and to understand residents' perceptions of conservation activities. Architectural documentation, semi-structured questionnaire surveys, and non-participatory observations were used as the research method. The study concluded that conservation activities

should be a participatory process, with better communication between the stakeholders and the establishment of local conservation offices. In research by Shao and Zhang (2018), Zengchong Village in China was studied; it was concluded that the performance of the traditional village was not perfect, and it must incorporate changes to accommodate the changing socio-economic background.

A study on the conservation of traditional houses and settlements of weavers, conducted by Bagchee (2018), discusses the significance of the weavers' residences and their close connections with the craft of weaving. The study also discusses a pilot project, conducted by the Indian National Trust for Art and Cultural Heritage (INTACH), that involved the documentation and analysis of two vernacular weavers' residences in Chanderi, Madhya Pradesh. These were conserved by understanding how the requisites of weaving were interlinked with the principles of traditional architecture and provided cost effective solutions to upgrade the living standards of weavers. Vijayasree (2018) analysed weavers' residences in Iyengarkulam village, Kanchipuram, where the typology of the residences was identified to analyse how they responded to the culture and spatial requirements associated with weaving. In a study conducted by Ray and Shaw (2018), a traditional settlement in Kolkata, West Bengal, was analysed with reference to the climate responsiveness and socially inherent spaces in its built form. The results showed that the local community adhered to changes in the traditional built form for multiple reasons. It was concluded that the traditional houses needed better adaptation without compromising their passive cooling features and socially inherent spaces.

The vernacular houses and weaving techniques of the Maheshwari handloom weavers were documented and studied by Khare (2019). Through primary and secondary data collection, the study analysed the transformations in the weaving tradition, vernacular weavers' houses and the issues faced in the craftsmanship as well as the workspaces. The study proposed measures to safeguard the vernacular architecture of the Maheshwari weavers through documentation, to understand the shifts that have occurred in weaving techniques and in construction methods, as well as the underlying issues. Panda and Parida (2019) studied the effect of living pattern and cultural pattern on vernacular residences in the weavers' settlement at Nuapatna, Odisha. It was seen that the spatial design of the weavers' house reflected their tradition. Currently, government policies at the central level do not focus on the housing sector of the weavers although there are policies for upgrading the economic status of weavers.

The current paper takes the case of a weavers' cluster in Pillayarpalayam, Kanchipuram, which consists

of a large number of traditional weavers' residences and is delineated as a heritage zone under the National Heritage City Development and Augmentation Yojana (HRIDAY) scheme by the Government of India. The HRIDAY city plan proposes strategies for economic and infrastructure upgrades to the selected weavers' zone. However, the potential for conservation of the traditional weavers' residence in the chosen precinct has not yet been explored. Moreover, in every case observed in India, conservation efforts have been mostly restricted to tangible heritage in terms of built form and sites. The current paper broadens the scope of conservation to include intangible heritage in the form of culture, lifestyles, social factors and production methods, in addition to the tangible heritage of traditional weavers' residences. The selected weavers' residences in this region were documented and analysed for their spatial and climate response features. Unstructured interviews with the community helped to understand their perceptions of conservation of their traditional workspaces as well as their opinions on the changes that have occurred over the years. The results will help to develop a more integrated conservation method that combines the responsibility of the local authorities and the opinion of the communities.

2 Study Area

2.1 Location and climate

Kanchipuram is a temple city located in Tamil Nadu (Fig. 1), a state of southern India. It is located at 12.83° N – 79.70° E, 72 km from Chennai, and on the banks of the Vegavathy river which is a tributary of the Palar River. Kanchipuram has two subdivisions—Shiva Kanchi which occupies the western portion of the city and houses several Shiva temples, and Vishnu Kanchi which is located in the eastern part of the city and consists of Vishnu temples. The city covers 36.14 km² and has an elevation of 83 m (275 ft) above sea level. The city has a warm and humid climate, where the air temperature varies from 16 °C (60.8°F) to 37.5 °C (99.5°F) in a year. The annual relative humidity varies from 58 to 84%, and the city receives the majority of its rainfall during the northeast monsoons which occur from September (average of 150 mm) to December (average of 237 mm).

2.2 Heritage zones in Kancheepuram

The HRIDAY scheme was established by the Government of India and funds are given out by the Ministry of Urban Development. It aims to bring together urban planning, economic growth and heritage conservation in an inclusive manner. Under this scheme, the local government uses agencies to create Heritage Master Plans

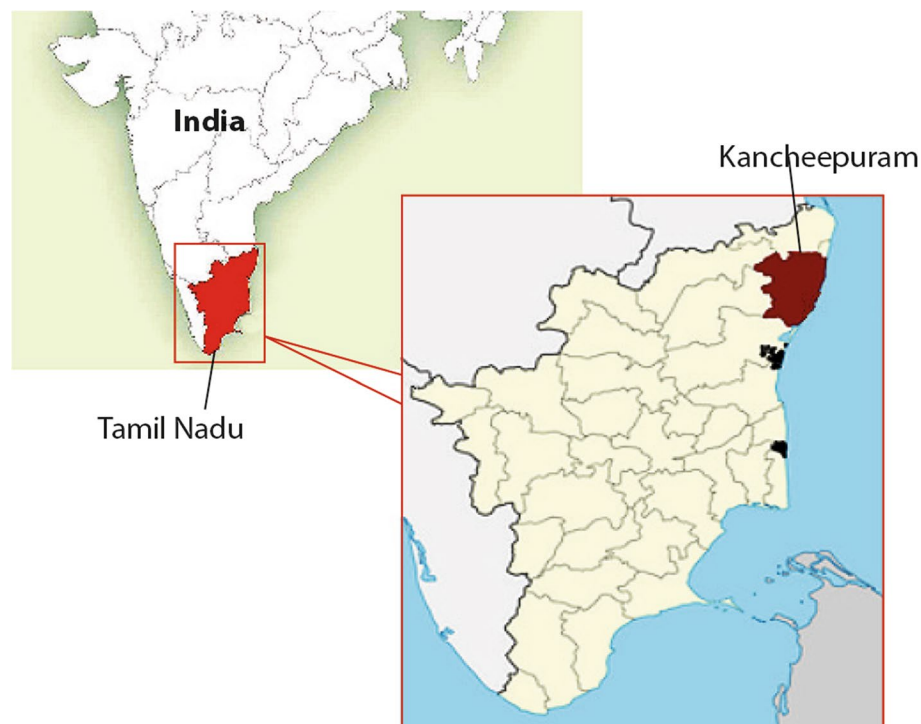


Fig. 1 Map showing location of Kanchipuram in India (Source: the author, based on the map from Wikimedia https://commons.wikimedia.org/wiki/File:Kanchipuram_district_Tamil_Nadu.png)

and Detail Project Reports and ultimately to oversee their implementation (Patel and Tayal 2018). Kanchipuram is included as one out of 12 cities in India by the central Government under this scheme. Figure 2 shows the five sites, delineated as heritage zones in Kanchipuram, which includes four temples and a weavers' zone. This delineation was based on discussions with the local government, city anchors—who are consultant to the Government of India, Ministry of Urban Development and the representatives of the municipality.

2.3 History and culture

Kanchipuram, during the early Christian era, was a centre of urban concentration, mainly because of its geographical setting along the banks of the river Palar, which gave access to trade. By the 7th century it had become a Royal Centre with a strong commercial and craft base. The process of urbanisation began during the Pallava rule in the 7th Century, but grew significantly during the Chola period in the 10th Century, during which the craft of weaving gained importance. Weaving was seen as a prestigious occupation, which produced silk clothes for the temples and for the king. The natural heritage of

Kanchipuram is focused on the Palar river which gave rise to a historic water system in the city consisting of canals, tanks and surface water ponds. The cultural heritage of the city comprises tangible heritage in the form of historic temples, traditional residences, mandapas (pavilions) and sculptures, and intangible heritage in the form of crafts like weaving and idol making. The city has immense religious and cultural significance and has been chosen as one of the heritage cities for HRIDAY Heritage City Development and Augmentation Yojana scheme by the Government of India.

2.4 Survey area

While the city's intangible heritage is rooted in its crafts, the city also has tangible heritage in the form of some vernacular weaver's homes that are slowly being transformed. The HRIDAY scheme has identified five zones of cultural and historical significance that need to be conserved and protected. One of the identified precincts is the Pillayarpalayam weavers' zone. Out of the remaining weavers' clusters, the Pillayarpalayam weaver's zone has the highest density of traditional weavers' residences in Kanchipuram. The delineation

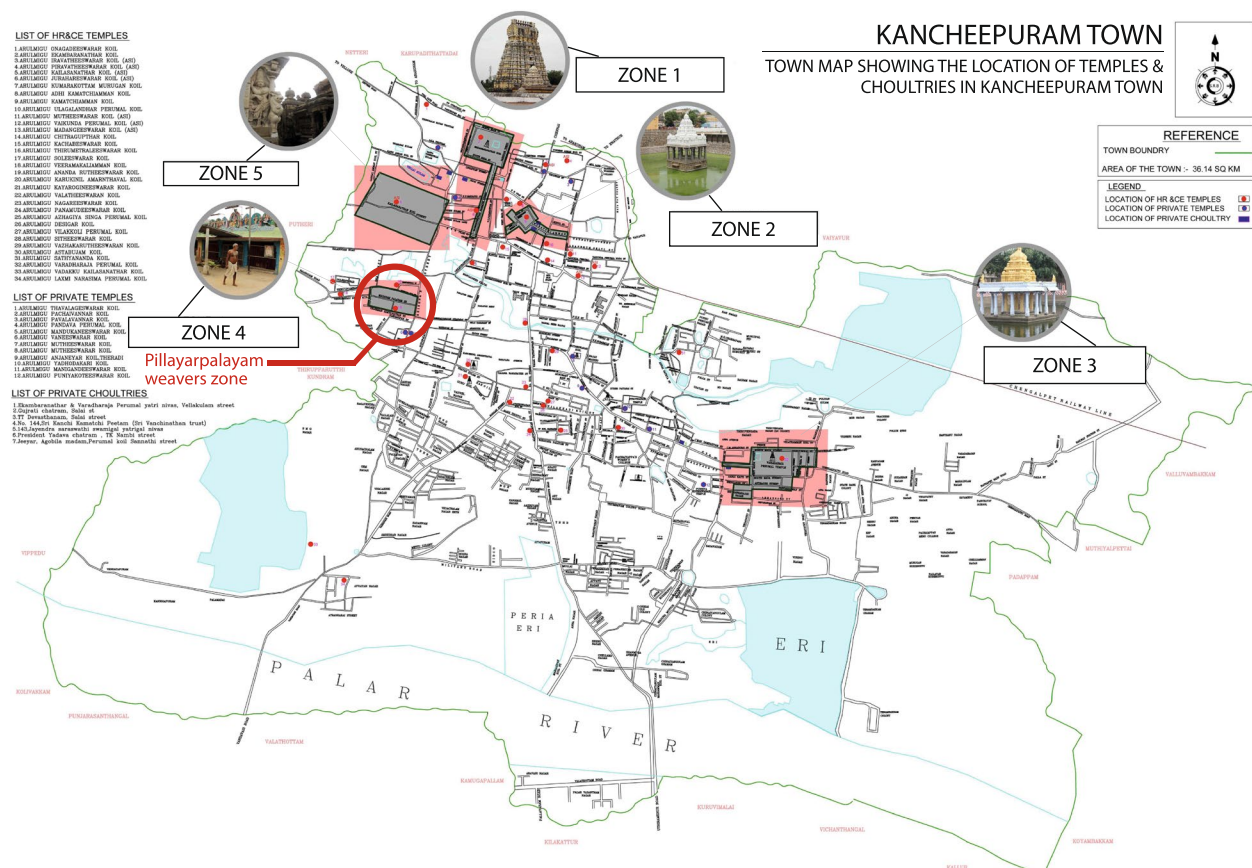


Fig. 2 Map showing the heritage zones of Kanchipuram (Source: Abha Narain Lambah Associates 2015)

is on the basis of the large weaver population (approximately 3500 people) and a higher percentage of traditional weaver residences where the craft continues to be practised (City HRIDAY Plan Kancheepuram, Tamil Nadu, India, Abha Narain Lambah Associates). This zone is close to the Kailasanathar and Ekambareswar temples which gives it an historic and cultural significance. It can be seen from Fig. 3 that the delineated heritage zone has a mixed land use, but majority of the residences have weaving units within the house. The specified area is laid out in a grid pattern with adjoining backyards. There are a few tertiary streets in the town, which branch into small cul-de-sacs to form small clusters of weaving groups.

3 Methods and materials

The HRIDAY scheme (Abha Narain Lambah Associates 2015), developed by Abha Narain Lambah Associates, was used as the source of secondary data to understand the history, culture and tangible and intangible heritage assets of Kanchipuram. Secondary data regarding the delineation of Pillayarpalayam weavers' zone as a heritage asset of the city, a land use map and settlement patterns were also collected from the HRIDAY scheme (Abha Narain Lambah Associates 2015). Primary surveys along with unstructured interviews were conducted to understand the socio-cultural values, lifestyles, traditions and the difficulties faced within the cluster. A spatial analysis was also carried out to understand how weaving activities

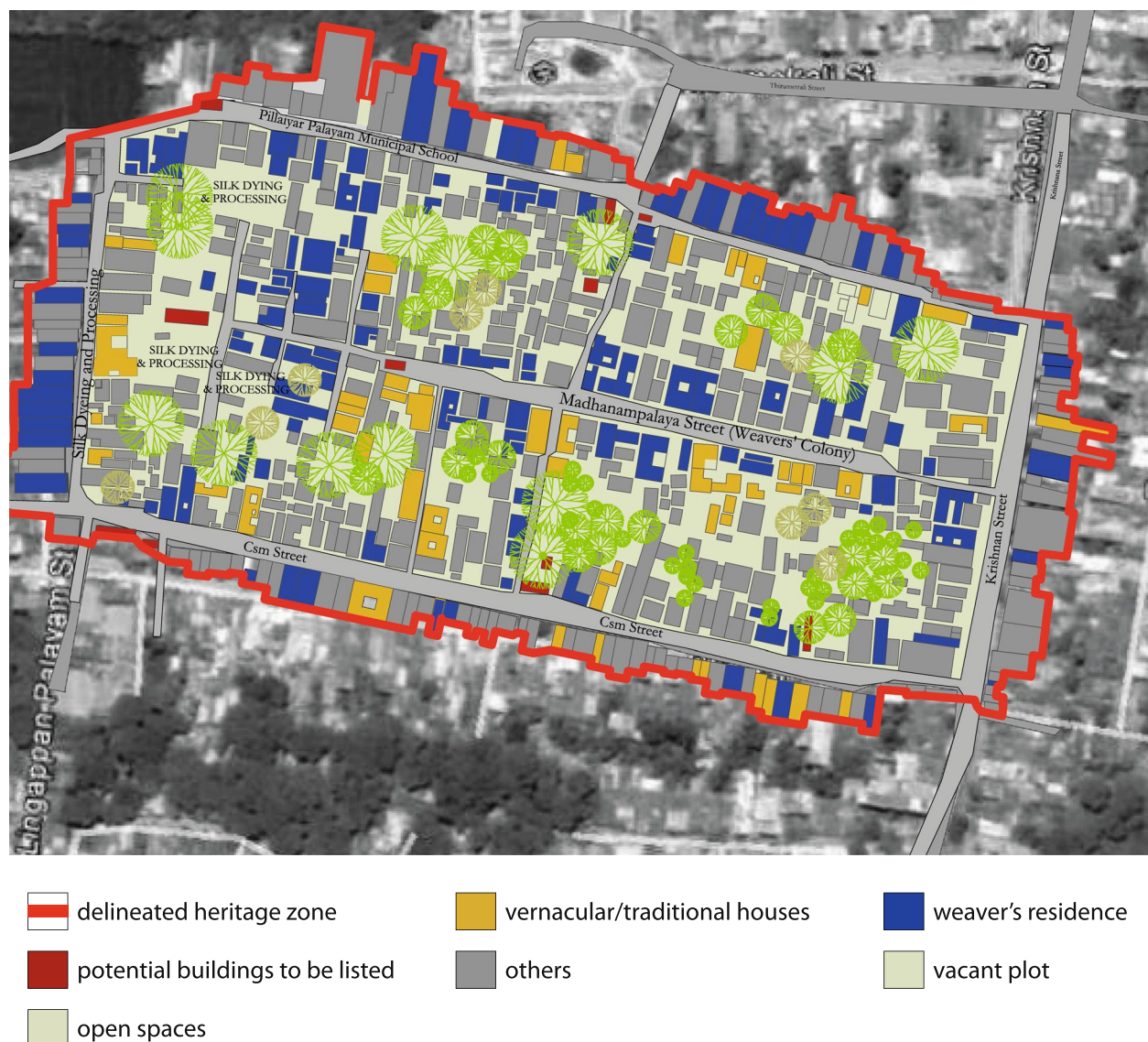


Fig. 3 Map showing the land use within the Pillayarpalayam heritage zone (Source: Abha Narain Lambah Associates 2015)

were incorporated in the physical setting of spaces in the streets, dwellings and the cluster. Unstructured interviews, with informed consent, were conducted with the occupants of Madhanampalaya street which houses 30 traditional weavers' residences. From these, information was collected regarding the processes involved in the craft of weaving, the infrastructure facilities required, their supporting organisation, the socio-economic structure and the use of advanced technologies. On the basis of the family setup, three typologies of traditional weavers' residences in the Madhanampalaya street were identified. Primary documentation and analysis of these typologies (refer to Figs. 13, 16 and 19) was conducted to identify the climatic features, building materials and construction techniques in these residences.

4 Pillayarpalayam weavers' zone

4.1 Settlement pattern

The delineated weavers zone follows a grid pattern, with the majority of land use being residential. From Fig. 4, it can be seen that a large percentage of houses are traditional weavers' residences. The built fabric is dense and lacks open spaces. This is mainly because extensions are being built in the backyards of the residences, and because of the subdivision of plots.

The zone also has some dyeing and processing units. However, owing to health problems as a result of the dyeing process, this activity is no longer carried out within the residences.

The layout of residences reflects the traditional Agraharam style. In a typical Agraharam, there are rows of

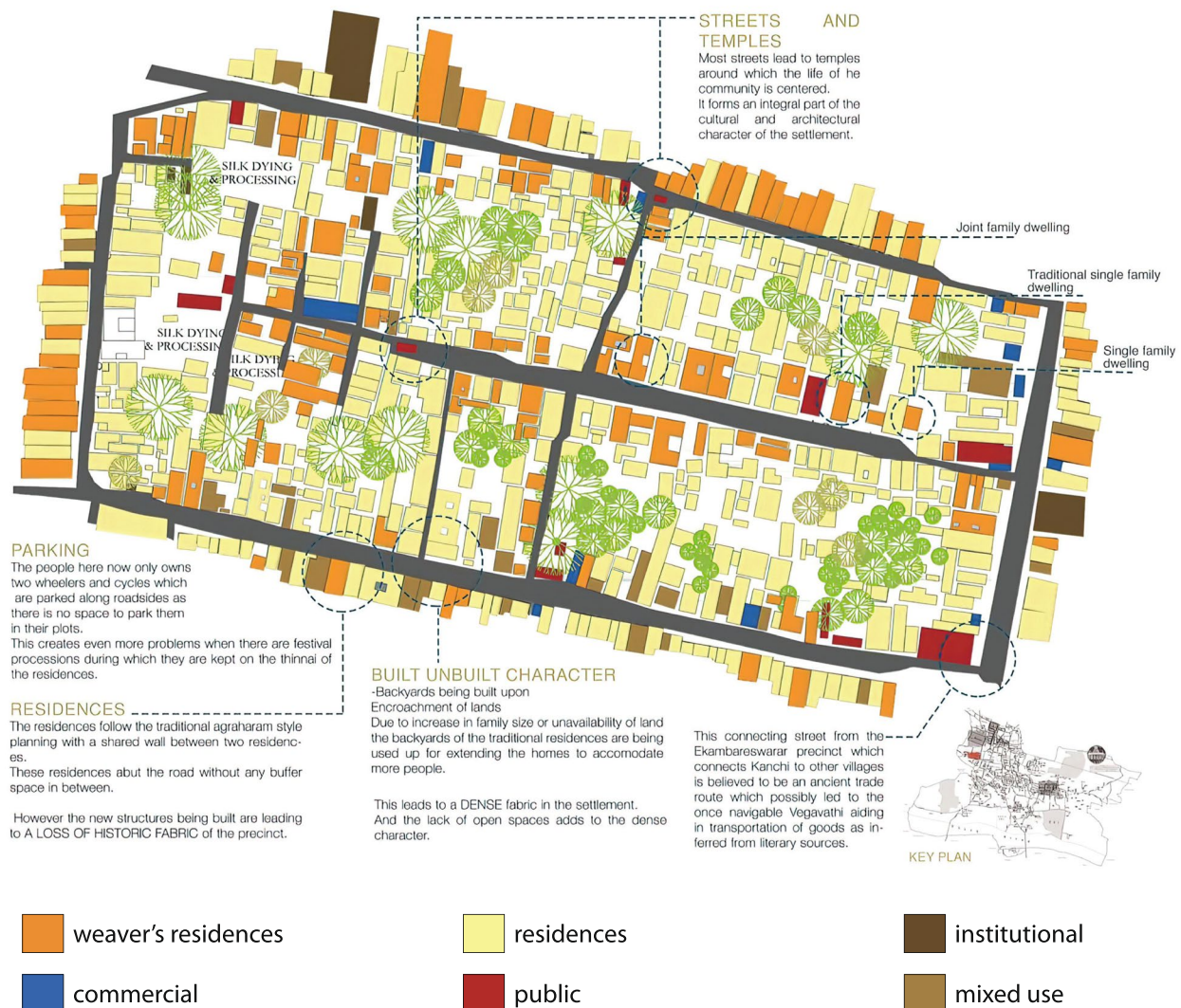


Fig. 4 Figure showing the settlement analysis of Pillayarpalayam weavers' zone (Source: Abha Narain Lambah Associates 2015)



Fig. 5 Krishnan Street leading to the Ekambareswar temple (Source: the author)

houses lining either side of the street with common walls. The focal points of Agraharam are temples. The alignment of the street is from east to west. The features include shared walls between adjacent residences, sloped roof with hand-made baked clay tiles, wooden rafters, lime plastering and a courtyard within the house. Large platforms called *thinnai* line on the outer walls and extend towards the street. These are covered with the long eaves on the sloped roof. The *thinnai* serve as platforms on which people can sit and have conversations or lie down for a nap. The flooring is predominantly red oxide. These are the typical features of the Agraharam style.

4.2 Cultural fibre

The cultural fibre of the city is defined by four layers—temples, tanks, streets and households. These layers form the core around which the daily life of the community is centred. Religion and culture coexist in the cluster, where most streets lead to temples that form an integral part of their lifestyle and tradition. Waterbodies are considered sacred by the community, and can be in the form of village ponds, temple tanks and ‘*eri*’ (a traditional water management system).

4.3 Street character

The access to the Pillayarpalayam weavers’ zone on the eastern edge is from the Krishnan Street, which connects it to the Ekambareswar temple (Fig. 5). This street has intense economic activity and is lined with street vendors

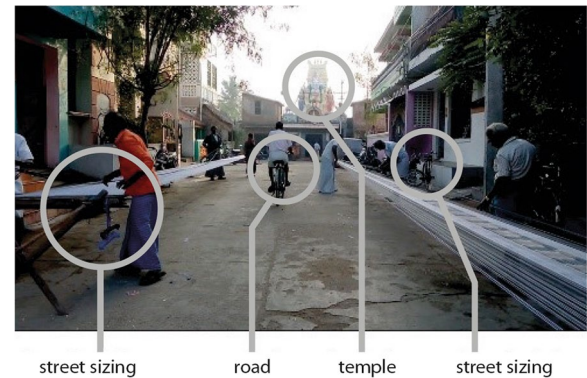


Fig. 6 Street-level activities in the weavers’ zone (Source: the author)



Fig. 7 Vehicles parked on the streets (Source: the author)

and craft shops. The streets within the cluster lead to smaller temples, which is one of the major characteristics of the neighbourhood. The unique identity of the streets in the weavers’ zone is defined by the street sizing activity carried out by the weavers, mainly during the mornings. As seen from Fig. 6, this activity involves stretching the yarn on the warping machine, along both sides of the street. Figure 7 shows that two wheelers and bicycles are also parked on either side of the street because most of the residences abut the road without a front setback. This, along with the street sizing activities, causes congestion on the roads.

4.4 Activity

A primary study was conducted to assess the activities of a typical day. Figure 8 depicts a day circle which shows the activities of the community in a typical day. It can be seen that temples form a major part of the daily routine, during the early mornings and late evenings. Most of the social interaction within the community also happens during these times, either in the *mandapas* of the temple or under the trees within the cluster. The street sizing activity usually happens during the mornings before the sun rises, to avoid bleaching of the silk yarn. Figure 9

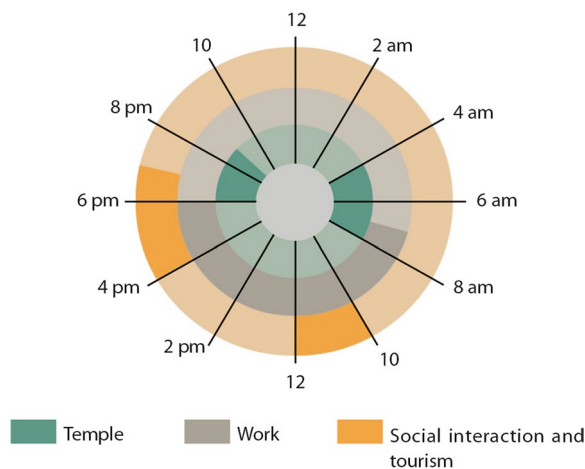


Fig. 8 Day circle showing the activities of the community in a typical day (Source: the author)

shows that the daily lifestyle of the community is centred around their religious beliefs and their work culture.

4.5 Socio-economic structure

Only a small percentage of the weavers work with master weavers or in the private sector (Fig. 10). Most of them prefer to work in the cooperative sector. This is due to the low wages that the private sector offers and the poor working conditions within the residences. Most weavers also prefer to work with mechanised looms rather than the manual looms that are used within the residences. It usually takes 4 to 5 days to weave a simple silk saree, although this may extend up to 14 days, depending on the complexity of the design. On average, a weaver earns INR 3,000 (40 USD) per month. The majority of the younger generations are unwilling to take up this craft because better opportunities and options are offered in the cities. Because weaving is a home-based enterprise, most people are acquainted with the craft at a very young age. Women in the family are also engaged in the weaving

activities, like wefting and spinning of the yarn. Most residences have 5–6 occupants. However, the cluster also includes a small percentage of joint family setups.

4.6 Spatial analysis of workspaces

The entire process of weaving involves five major stages: dyeing and degumming, warping, street sizing, wefting and weaving. Table 1 shows that warping, wefting and weaving are home-based activities which require sufficient provision of space within the residences to accommodate the loom and other equipment. The spatial characteristics of workspaces are as follows:

- Dyeing and degumming—these activities are held in dyeing centres within the cluster because they can cause health problems from exposure to hot fumes during the process.
- Sizing—this is an outdoor activity which involves stretching the silk yarn on a warping beam. It is mostly done on the sides of the street during the early morning.
- Wefting—this is an ancillary activity that is mostly carried out by the women of the household. It is a home-based activity done either in the loom space or in the buffer space around courtyards. Figure 11 shows that a space of 2.5 m² is required for this activity.
- Weaving—traditional pit-loom are preferred by the weavers because of their efficiency and because they have better moisture control. Jacquard machines, which are devices fitted to looms to simplify the process of weaving complex patterns and designs, are installed on most looms for easier and better designs. Figure 12 depicts the spatial requirement for pit-loom and raised pit-loom. The equipment requires a room height of at least 4 m to accommodate the looms and its parts.

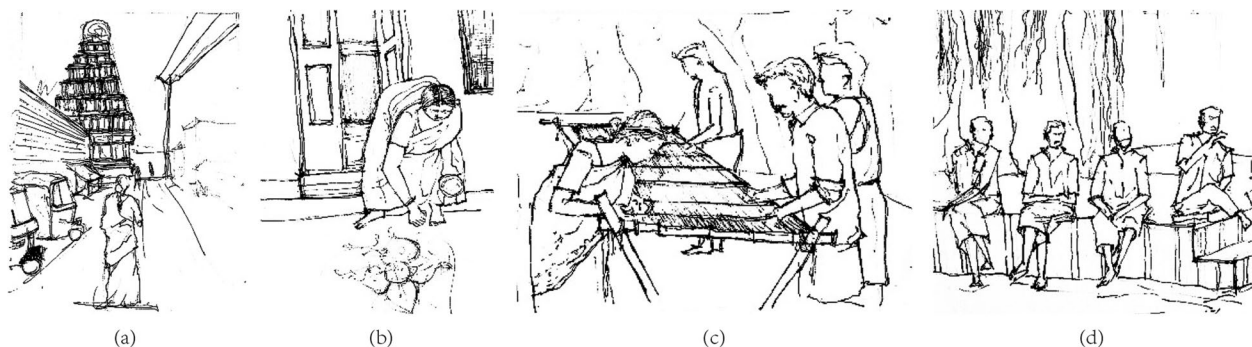


Fig. 9 **a** Temples are the prime focus of daily activities of the community, **b** morning ritual of applying 'kolam' (design on ground made with rice flour) in front of the residences, **c** the street sizing activity, **d** social gathering spaces in the form of a raised seating under a tree (Source: the author)

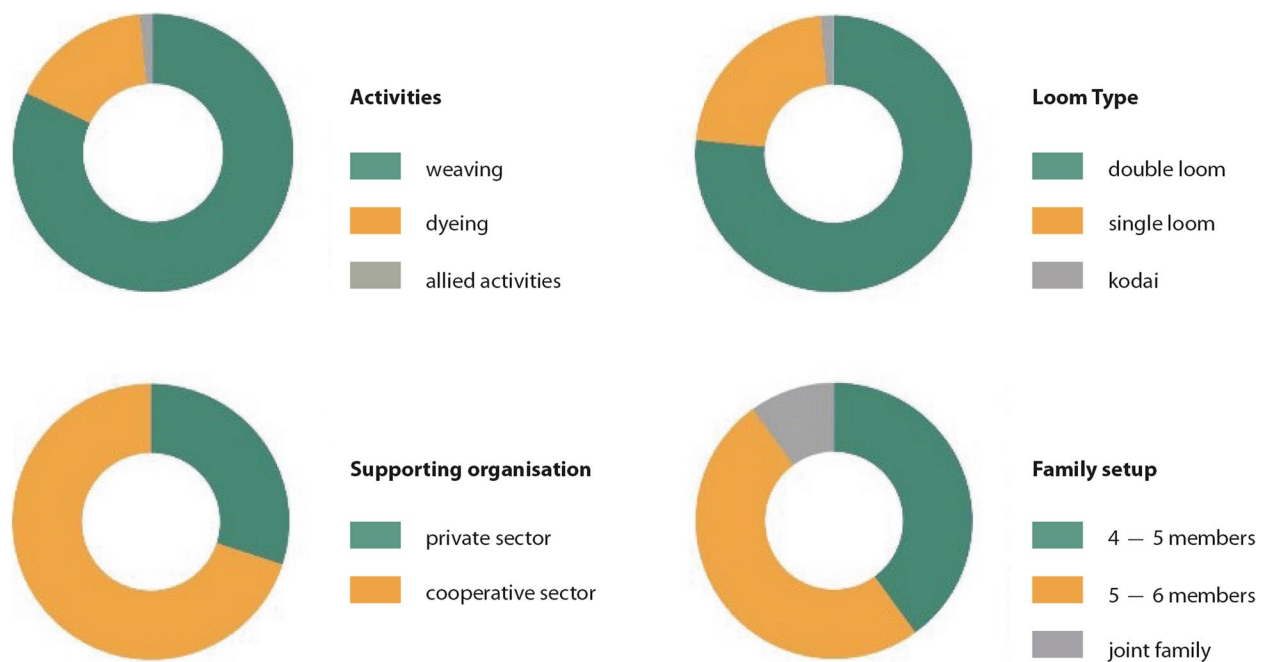


Fig. 10 Activities, loom types, supporting organisation and family setup within the cluster (Source: the author)

Table 1 Spatial requirements for various processes involved in weaving

Production Process	Workspace	Tools Required	Spatial Requirement	Area
Degumming	Dyeing Units	copper containers, acetic acid, soap oil, boiler	semi covered, to let out hot fumes, with storage space for dyes	30 sq m
Dyeing				
Warping	Home Based	warping machine or street sizing equipments	covered	4 sq m
Sizing	Streets	bamboo poles	open	60 sq m
Wefting		charqa, bamboo spool		4 sq m
Weaving	Home Based	pit loom, raised pit loom	covered	9 sq m

5 Vernacular weavers' residences

5.1 Dwelling typologies

The layout of the residences in the cluster follows a row house pattern, with a linear arrangement on both sides of the street which leads to a temple. These traditional residences depict the compact and linear planning of spaces and consist of two shared walls between adjacent residences. On the basis of the family setup, three typologies of traditional weavers' residences were identified in Madhanampalaya street. The first one was a traditional single-family dwelling with four members, with a front yard and backyard. This typology reflects a few residences in the street that have not undergone major alterations to the traditional structure and planning of spaces. The second typology is a '2 person single-family dwelling', without any setbacks from the street and lacking a backyard. The third typology is a joint family residence with 10

members, with a small front yard. The basic layout of the three typologies remains similar, and consists of spaces to incorporate the weaving activities along with their household activities.

5.2 Spatial planning in residences

5.2.1 Traditional single-family dwelling of 73 m²

These residences are separated from the facing street by a front yard of 2 m. This space is used mainly for the parking of two wheelers. The dwelling starts with a thinnai or veranda with a raised seating area that acts as a transition space between the residence and the street. It also acts as a space for social interaction. Figure 13 depicts the functional planning of the traditional single-family dwelling. The thinnai leads to an open-to-sky courtyard of 1.5 m × 3.5 m, surrounded by a walkway. The space around the courtyard is used for ancillary activities like

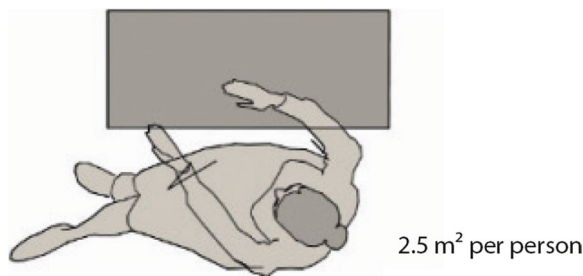


Fig. 11 Space requirement for wefting (Source: the author)

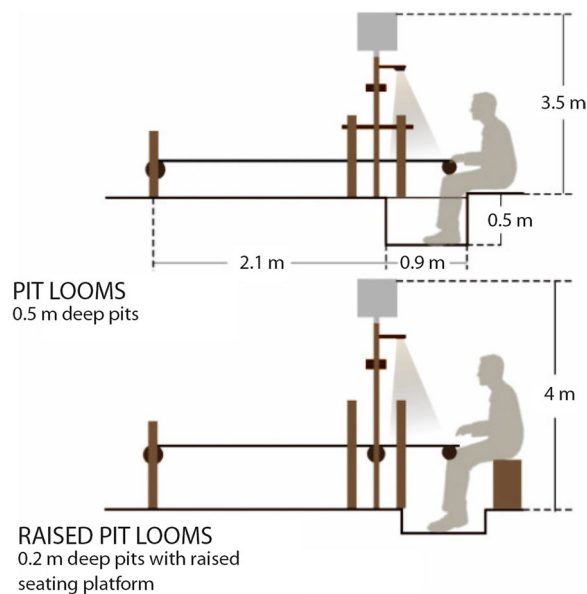


Fig. 12 Spatial requirement for pit-looms and raised pit-looms (Source: the author)

spinning. The courtyard has a thulasi madam in the centre. Thulasi madam is an altar over which a Basil plant is placed along with a lamp. In India, it is believed that the Thulasi herb represents duty, dedication, love, virtue and sorrows of all women. The Thulasi madam is a sacred space which is worshipped by women. Traditionally, courtyards were also used for dyeing activities, and for drying the yarns which requires exposure to the sun. However, owing to health issues, dyeing now happens in dyeing centres within the cluster. Facing the courtyard is a hall, also known as the 'koodam', which is a space that accommodates the loom required for weaving. This space doubles as a living area for the family. At the rear end of the residence is the kitchen which has access to the backyard. The toilets are detached from the residence and are located at the rear end of the backyard. Figures 14 and 15 show that the roof structure is designed in such a way

as to accommodate the parts of the loom and also equipment such as spools that are required for weaving.

5.2.2 Single-family dwelling

This typology of residence does not have a thinnai facing the streets as can be seen from the floor plan depicted in Fig. 16. Instead, the residence is fronted by the workspace which accommodates the loom. The living areas are segregated from this workspace by a corridor consisting of a small courtyard. Figure 17 shows a section through the residence. With a total area of 40.5 m², the residence has small, congested rooms and lacks front and rear open spaces. The two wheelers are parked on the street and lead to further congestion on the road. The traditional pit-loom, as shown in Fig. 18, is accommodated in the workspace.

5.2.3 Joint family dwelling

This typology is an extension of the traditional single-family dwelling, measuring 165 m². Here, the backyards have been converted into rooms to accommodate the family needs. However, the residences have a small front yard and thinnai. Figure 19 depicts the functional planning of the joint family dwelling. There is a kitchen adjacent to the front hall, which is common to all the family members. Figures 20 and 21 depict the section and photos, respectively, through the residence that shows the extension to the structure at the rear to accommodate additional rooms and toilets. Despite several adaptations to the structure, the courtyard and the 'koodam', which are present in the traditional single-family residence, are maintained in this typology. Here, the 'koodam' accommodates two looms: a pit-loom and a raised pit-loom. The space around the courtyard is used for pre-loom activities by the women of the house. Towards the rear are rooms for each member of the family which also incorporate single pit-looms. Common toilets for all the family members are present towards the rear, attached to the structure of the residence, unlike the traditional typology.

5.3 Materials and construction technique for vernacular houses

Locally available building materials are used in constructing the vernacular houses of weavers. The houses have walls made of brick with lime plaster which absorbs moisture and prevents the wall from cracking. Large granite slabs are used as a facing for the thinnai and in areas where wooden columns rest directly on the floor, to prevent damage from frequent usage. Mud which is mixed with jaggery and locally available waterproofing admixtures are used in the flooring. These soft floors are regularly treated with a

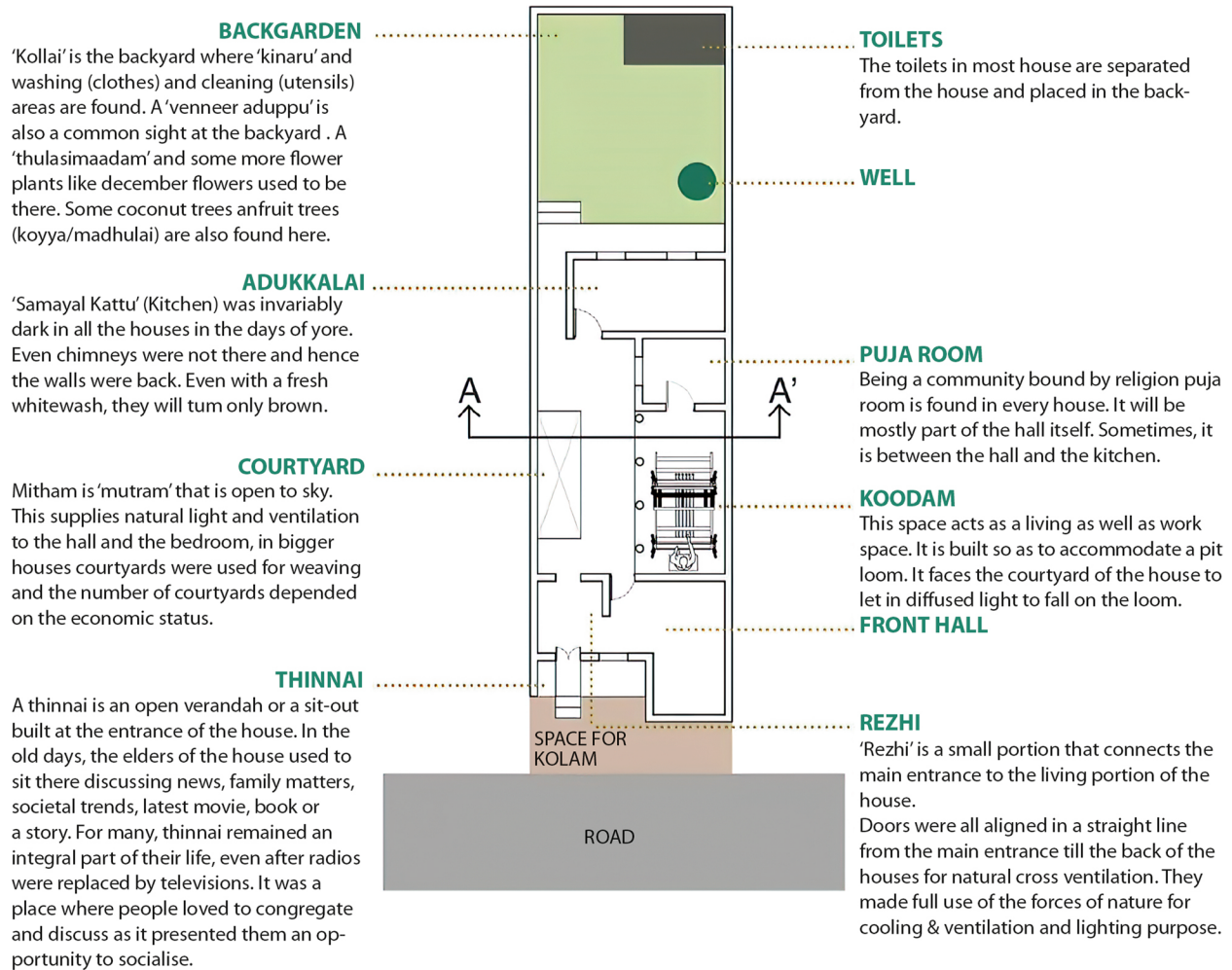


Fig. 13 Floor plan of traditional single-family dwelling and its spatial characteristics (Source: the author)

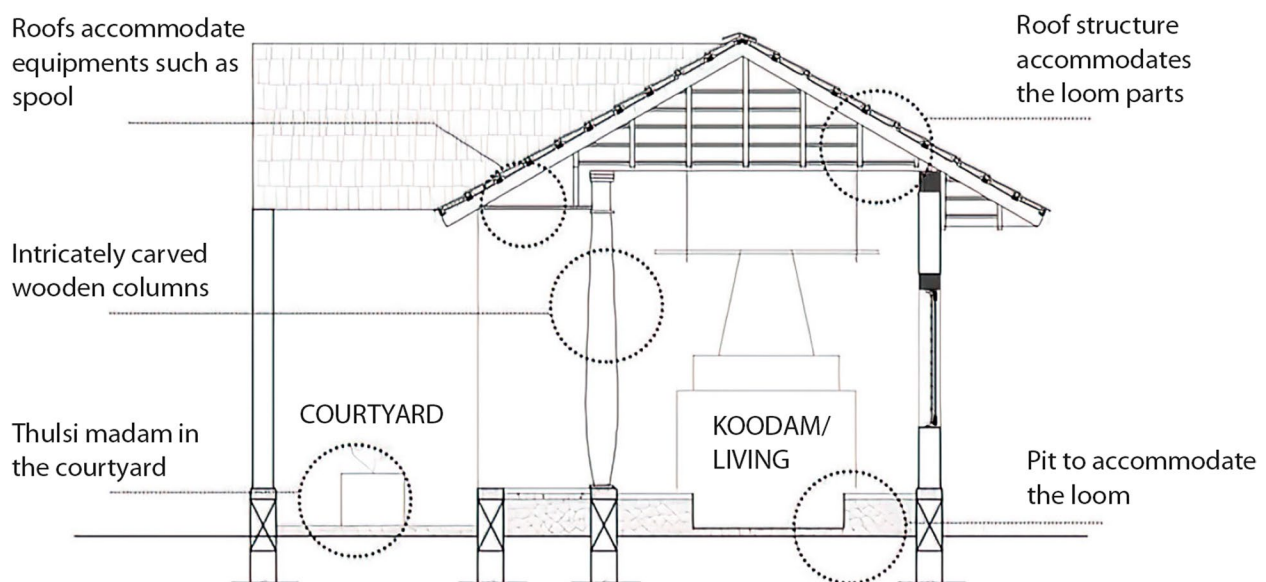


Fig. 14 Section showing the workspace and adjoining courtyard (Source: the author)



Fig. 15 Photographs depicting the roof structure, courtyard and thinnai of the traditional single-family dwelling (Source: the author)

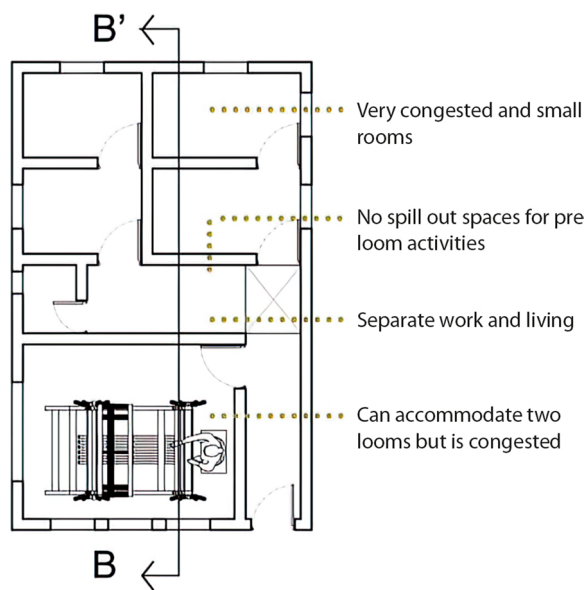


Fig. 16 Floor plan of single-family dwelling and its spatial characteristics (Source: the author)

wet mixture of mud and cow dung and are suited to careful handling of the weaving accessories. The roofs are sloping with wooden rafters and purlins, covered with clay tiles. All residences have rosewood columns on the front veranda and courtyard. All doors and windows are made of rosewood. The weavers' workspace accommodates the traditional pit-looms.

5.4 Climate response features

The planning of the settlements and the architecture of the house follows the basic principles of climate conscious architecture such as orientation of the house,

provision for cross ventilation, use of appropriate building materials etc.

Orientation—the residences are oriented along a north–south axis. The longer east and west walls are shared between the adjacent residences and are not exposed to solar radiation, thus reducing the heat gain.

Buffer spaces—shaded spaces like the front veranda with the thinnai and reinforced concrete veranda facing the backyard act as buffer spaces, reducing glare and doubling as comfortable spaces for social interaction.

Courtyards—courtyards, which form an integral part of the traditional residences, act as a microclimate modifier. The workspace or 'Koodam' faces the courtyard, which provides adequate daylight and ventilation to maintain a comfortable environment for the weavers to work. The courtyard acts as a natural channel to allow the smoke and heat of the house to escape.

Rainwater harvesting—the roofs are sloped in such a way as to collect the rainwater in the courtyards, from where it is channelled into the well in the backyard through stone culverts.

Cross ventilation—the doors and openings are in a straight alignment from the thinnai to the door leading to the backyard of the house. This aids cross ventilation.

Building materials—the brick and lime plastered walls maintain the thermal comfort of the occupants because they are permeable building materials. They absorb moisture and maintain balanced humidity levels in the workspaces. This prevents the yarn from breaking. The floors in the traditional houses are mud floors, which facilitates digging of pits for the looms. The flooring is treated regularly with a wet mixture of mud and dung, which acts as a repellent to termites and insects that can ruin the organic silk yarn.

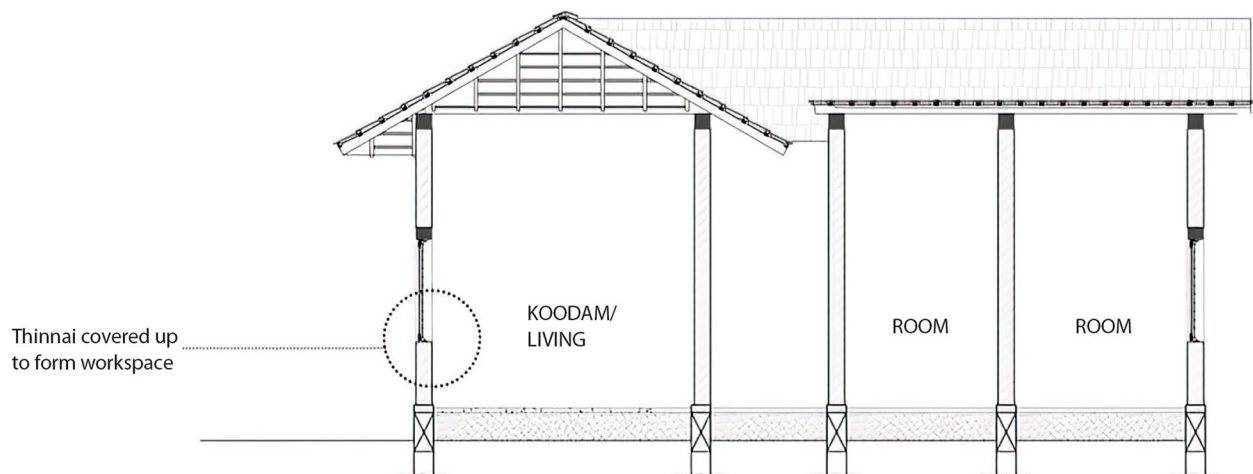


Fig. 17 Section of single-family dwelling (Source: the author)



Fig. 18 Details of the single-family dwelling (Source: the author)

6 Discussion

Kanchipuram is famous for silk saree weaving, which is a significant part of its cultural heritage. The Pillayarpalayam weavers are one of the very few weavers' clusters in Kanchipuram that practice the traditional techniques of weaving and still retain their traditional workspaces to a certain extent. It was observed that a few of the residences in the cluster had not undergone major alterations to their structure and the traditional workspaces still accommodate pit-looms and other traditional equipment required for weaving. Over the years, these residences have evolved to accommodate present-day needs and family sizes. These changes and adaptations are a continuous process, and they need to be surveyed to understand how communities evolve. However, this type of survey is beyond the scope of the current paper.

6.1 Workspaces

From the primary survey, it was observed that majority of the weavers prefer to work in the residences and not in factories. However, owing to the poor working conditions in most of the residences, they are forced to work in factories. The poor working conditions are due to the following reasons:

- i. congested rooms and inadequate space for the equipment because of alterations to the structure to accommodate more family members;
- ii. inadequate light and ventilation because the courtyards have been covered with galvanised iron sheets which affects both the work and living environment;
- iii. lack of timely maintenance that leads to leaks in the houses during the rainy season, creates uncomfort-

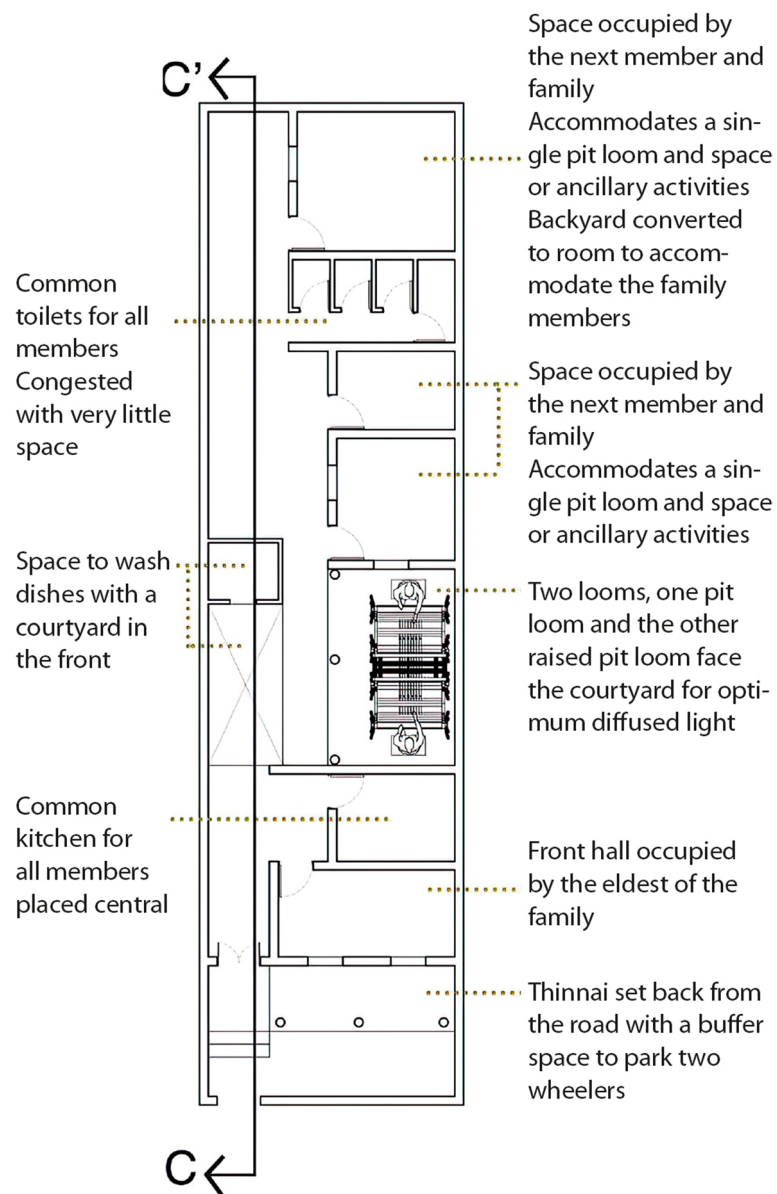


Fig. 19 Floor plan of a joint family dwelling and its spatial characteristics (Source: the author)

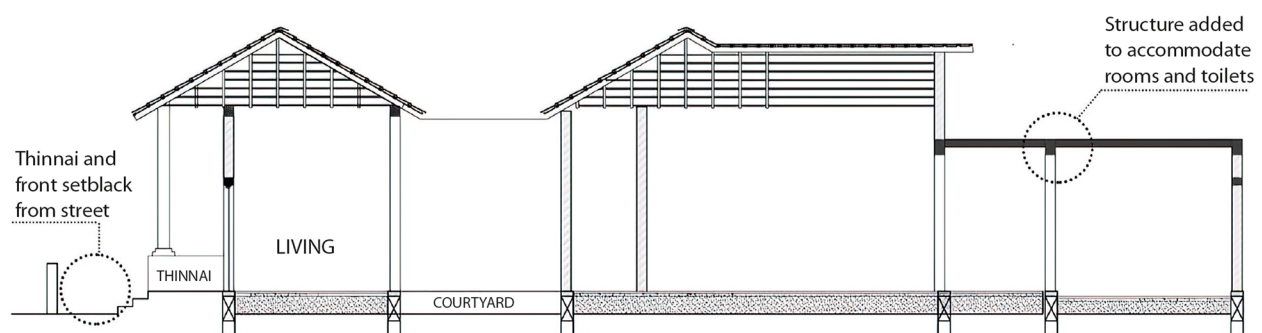


Fig. 20 Section of joint family dwelling (Source: the author)



Fig. 21 Details of a joint family dwelling with a room accommodating the loom, the courtyard and the entrance (Source: the author)

able working conditions and destroys the silk yarn because of high humidity levels;

- iv. alterations to the traditional building materials such as replacing the mud floor with tiles over time, which causes damage to the accessories that require special care and handling. Termites and insects are also an issue that can affect the silk yarn;
- v. the construction of new residences from concrete block masonry with cement plaster and reinforced cement concrete roofs. This does not maintain the temperature and humidity levels at comfortable limits, unlike the lime plastered walls and tiled roofs which ensure balanced temperature and humidity levels and provided comfortable work environments.

Weaving units are currently located in the city, where a large hall houses approximately 10 looms. These units are planned along with processing and packaging units for ease of material handling. Two dyeing units are present in the Pillayarpalayam cluster, which are semi-open spaces with boilers and drying spaces.

6.2 Modes of production

Although the weavers have made some alterations to the structure of their houses, the modes of production have not changed. The use of pit-looms, wooden spools, and the street sizing activity are traditional techniques of production that remain intact. However, the natural dyes have been replaced with synthetic and acid dyes. A very small percentage of weavers have also started computerising their design, although the majority of them follow the traditional designs.

6.3 Cultural aspects

It was observed that the community holds strong social and cultural values. The community is close-knit and maintains social interaction through the traditional layout of its streets, semi-open and open spaces. However, in some residences, the thinnai has been covered up and converted into a room. Additionally, the new residences that are being constructed are separate houses as opposed to the traditional Agraharam layout which

disrupts the human scale of the traditional layout. Temples and festivals are a major aspect of cultural significance within the cluster. The street sizing process in the cluster is a morning activity that presents a unique image reflecting the weavers' occupation. However, owing to inadequate street widths and setbacks of the residences, this activity causes congestion in the streets. Parking of vehicles also causes congestion.

6.4 Social aspects

The younger generations are unwilling to take up the profession because of the low wages and better job opportunities in the city. The middlemen between the product and market are also a threat to the industry.

6.5 Neighbourhood

The settlement pattern and built form characteristics of the cluster are changing rapidly owing to the construction of new structures. The density of the urban fabric is increasing because the backyards and open spaces are being built upon. The low-rise structure of traditional Agraharam typologies is being replaced by taller structures.

The Pillayarpalayam weavers' cluster has undergone changes to its built form, owing to changes in the socio-economic structure as well as in the expectations of the local community, particularly the younger generation. These changes have evolved in response to the current needs and aspirations of the society. While some of the changes are imperative, the authenticity of vernacular built heritage should be maintained. Consequently, proper guidelines for the conservation and maintenance of existing residences and proper construction of new residences are required with the cooperation of the local government, experts and the local community. Considering that community participation is vital to the conservation of vernacular heritage, proper information sharing should be ensured between the stakeholders and the community. This would provide a balance between the conservation of the built form and the aspirations of the community, thus ensuring sustainable growth to the craft as well as to the community.

7 Conclusion

This paper studied a weavers' cluster in Pillayarpalayam, Kanchipuram that needs to be targeted for conservation. The HRIDAY scheme by the Government of India, which delineated this cluster as a heritage zone, proposes strategies for the economic and infrastructure development of this zone. The current paper stresses the need to include intangible and semantic values for conservation such as culture, lifestyles, social factors, and production methods, in addition to conserving the vernacular built heritage and workspaces. The vernacular houses of the weavers in this zone are slowly being transformed into built spaces that are not adapted to the climate and culture of the area. Although change and adaptation in the built form are imperative, there should be a balance between conservation and development, such that these changes do not negatively impact the socially inherent spaces and the cultural identity of such communities. The unique typology of architecture in a weavers' built space requires sensitive conservation efforts to protect and truly appreciate the industry of weaving. A more critical vision of the preservation processes is also necessary. The approach of the current study entails supervision, economic resources, adaptation to natural and cultural landscapes, as well as accounting for the requirements of climate and the specifics of the environment, buildings and spatial structures. This study focused its analysis at the landscape level, which is dynamic and inherently more integrated than broader scales, and can offer stakeholders more opportunity to engage with the core processes that shape a specific place. Stakeholders should be provided with more significant opportunities to integrate resiliency into their heritage development activities. Because the vernacular built heritage in this zone is vulnerable to change, there is an urgent need to propose guidelines and management plans, through initiatives such as INTACH and HRIDAY. These will go a long way to preserving the rich built environment which is instrumental in the handloom manufacture of the world-famous Geographical Indication (GI) trademark silk sarees of Kancheepuram. These proposals should be informed by and discussed in a timely fashion with the local government and the community. Considering that there are several similar zones of significant cultural and social values within India, such guidelines could be a way to propose comparable efforts in such areas and thereby encourage the preservation of India's built heritage.

Abbreviations

HRIDAY: National Heritage City Development and Augmentation Yojana;
INTACH: Indian National Trust for Art and Cultural Heritage.

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