

# STUDY ON HANDLOOM WEAVERS SECTOR AND THEIR SPACES IN TAMILNADU

Ar.Senthil kumar.J – II Year, M.Arch,  
Department of architecture,  
Periyar Maniammai Institute  
Of Science & Technology, Vallam,  
Thanjavur, India.  
email : kumarjsk19@gmail.com

Ar. Suganthi.S. – Assistant professor (SG),  
Department of architecture,  
Periyar Maniammai Institute Of Science &  
Technology, Vallam,  
Thanjavur, India.

**Abstract—** One of Tamil Nadu's most important economic activities is hand weaving, which employs 3.19 lakh weavers and 1.89 lakh households. Given that handloom weaving is the second-largest occupation in Tamil Nadu, there is a pressing need to address issues in the industry and in the community. Through this comparative analytical study on the handloom industries and the government's contributions to developments, issues, and prospects, along with documentation of the quality of the working environment for weavers in various locations, including Pillayarpatti (Kanchipuram), Sowrastra, and Pattu nool kara street (Thanjavur), Periya negamam (Tirupur), in Tamilnadu, architectural solutions for the development of the handloom industries have also been discussed.

**Keywords –** Handloom weavers' sector, modes of production, Government contribution, HRIDAY, Co-optex. Climate response, lighting condition.

## I. INTRODUCTION

This research includes a study of handloom weaving places in three different locations along with a comparative analysis through documentation to learn about the spatial quality and how the space is adapted for working, transformation of the space related to weaving through production. The spaces of the handloom weavers' sector community at various places in Tamil Nadu have different working environments, and most of their own houses are designed to adapt their weaving occupation. Along with discussing HRIDAY's work on handloom weaving and the cooperative society's involvement. [1]

## II. CASE STUDIES

### A. Considerations For Case Studies

- A whole traditional history and tradition. modification's to manufacturing methods and workplace environments, as well as some customary practises
- Complete alterations to conventional procedures, as well as adjustments to the method of production and the workplace.
- Location selection options in both the north and south. [2]

### B. Methodologies For Case Study

- Using data from the case study to understand the methods and techniques used by weavers and the problems they confront.
- Providing a questionnaire to the weavers. [3]

### C. Case Studies

- 1 – Pattu nool kara street, Thanjavur.  
Type 01- Subramaniyam residence  
Type 02- Ramajeyam residence  
Type 03- Rukmani residence
- 2 – Periya negamam, Tirupur.  
Type 01- Sandhya residence  
Type 02- Muruganandam residence  
Type 03- Magendran residence
- 3 – Pillayar palayam, Kanchipuram.  
Type 01- Sandhya residence  
Type 02- Muruganandam residence  
Type 03- Magendran residence

#### 1. Pattu nool kara street, Thanjavur, Tamilnadu.

250 families have used handlooms to weave in Thanjavur's Pattu Nool Kara Street for the past 120 years, but as of right now, only 15 families still use them. This is because they are not affiliated with any government agencies, they work for private clients, and the weavers do not encourage the next generation to carry on the tradition.

#### Modes of production:

The processes of manufacturing have altered even if the weavers have completely changed the design of their homes. They weave on wooden spools supported by steel pipe stands, and the street sizing business that used to take place here has been abandoned. However, synthetic and acid dyes have taken the role of natural colors. In this area, the entire weaving process has changed and now only involves weaving and wafting.

#### Wafting:

This is a supplemental task that is primarily completed by the household's female members. It is a domestic activity carried out either in the area used for weaving or the buffer zone surrounding courtyards. 2.5 m<sup>2</sup> of space is needed for this activity.

#### Weaving:

The weavers utilize modified traditional wooden spool looms with steel piped strands due to the limited available space. For simpler and better designs, jacquard machines devices mounted on looms to streamline the process of weaving

intricate patterns and designs are installed on very small looms.

### Climate response and spatial analysis of work

The planning includes fundamental concepts of climate-conscious architecture, such as housing orientation, cross-ventilation provisions, use of suitable building materials, etc.

### Orientation

The houses are arranged in a random manner, which is inappropriate given Thanjavur's climate. As a result, the buildings received more heat from solar radiation. Additionally, the homes received more heat due to changes in material and compactness, as well as insufficient ventilation. Because of this, weaving cannot be done in these houses.

### Buffer spaces:

There was no buffer space found.

### Courtyards:

There were no courtyards found.

### Cross ventilation:

No adequate ventilation is present in these homes; instead, the sole airflow is provided through the door opening. However, due to a shared wall, a kitchen chimney is there.

### Building materials:

The majority of homes were built using bricks, concrete, and cement, and relatively few of them had Mangalore tile roofs.

### Building details: Typology 01

Subramaniyam residence,

location: Pattu nool kara street, Thanjavur

occupant: 2nos, Area: 322.5 sqft,

Weaving machine: 1no machine,

Weaving place area: 120.5sqft

Lighting environment: Artificial light

Building Typology: Concrete roof house.

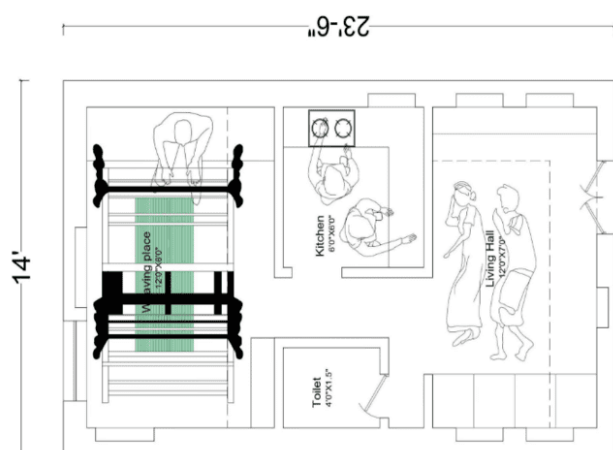


Fig 1 : typology 01 floor plan(Author)

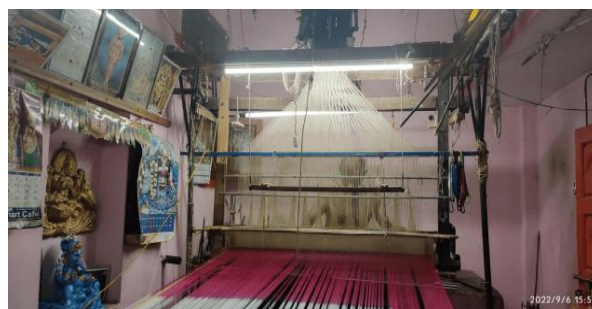


Fig 2 : typology 01 images (Author)

### Building details: Typology 02

Ramajeyam, residence,

location: Pattu nool kara street, Thanjavur

occupant: 2nos, Area: 380.5 sqft

Weaving machine: 1no machine

Weaving place area: 120.5sqft

Lighting environment: Artificial light

Building typology: Concrete roof house.

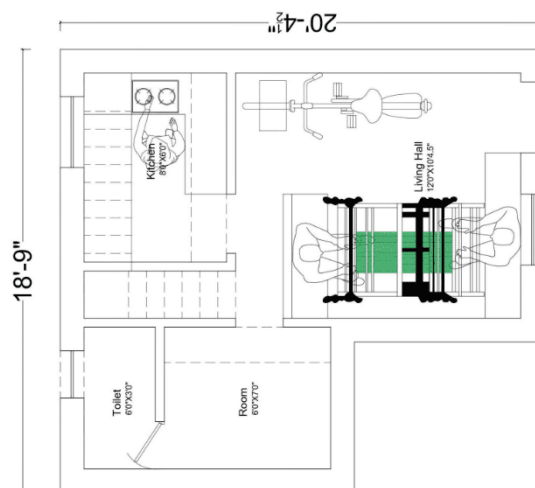


Fig 3 : typology 02 floor plan(Author)

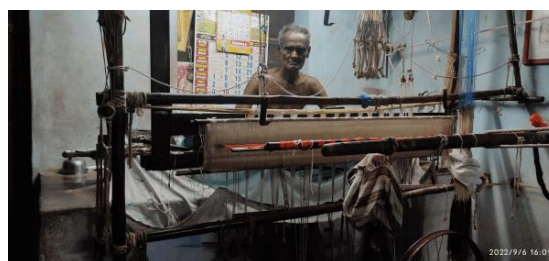


Fig 4 : typology 02 images (Author)

### Building details: Typology 03

Rukmani residence,

location: Sowrastra street, Thanjavur

occupant: 2nos, Area: 260 sqft

Weaving machine: 1no machine

Weaving place area: 110sqft

Lighting environment: Artificial light

Building typology: Concrete roof house.

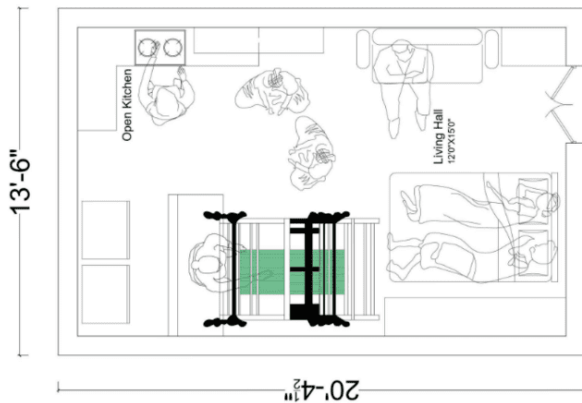


Fig 5 : typology 03 floor plan(Author)



Fig 6 : typology 03 images (Author)

## 2. Periya negamam, Thirupur, Tamil Nādu

The number of handloom weavers in Periya negamam, Thirupur district, is currently 60–70, but 20 years ago there were 150–200 people working in this field. Some of the weavers use artificial lighting for their weaving processes; they have installed CFL and LED lighting fixtures. They also work for private companies like Laxmi Silks, Ramya Silk Garments, Vinayakka Silks, etc. Up to 8–10 sarees every month, each costing between 5,000–15,000 rupees, will be sent with the material and design chart for weaving by the private sectors; they will pay and obtain these materials from the weavers, and the private sector silk garments will set a new price for the item and sell it. Because of this, they did not encourage their own children to perform this task.

**Modes of production:** Although the weavers have altered the design of their homes, they have also changed the techniques of production. Along with the handloom, they have modified the ways they purchase raw materials, weave, and use traditional weaving machines. Traditional methods of production that have been maintained with certain modifications include the use of pit looms, wooden with steel spools, and the street sizing activities in smaller quantities. The majority of them still use jakkart boxes and are given pre-dyed or designed silk threads for quick and simple work, although natural dyes have been substituted with synthetic and acid dyes. Each resident produces no less than 4-5 sarees each month and no more than 6-7 sarees. There are five steps in the complete weaving process.

**Dyeing and degumming** Because the exposure to heated fumes during the procedure can have negative health effects,

these operations take place in dyeing facilities within the cluster.

**Sizing** The silk yarn being stretched on a warping beam during this outdoor exercise. Because the weavers were given silk bundles that were of the right size, this practice is now less common. It is typically done in the early morning on the sides of the street.

**Wafting** This is a supplemental task that is primarily completed by the women in the household. It is a domestic activity carried out either in the area used for weaving or the buffer zone surrounding courtyards. 2.5 m<sup>2</sup> of space is needed for this activity.

**Weaving** The weavers favor classic pit looms because of their effectiveness and superior moisture management. However, 50% of weavers were still working in their own traditional, old residential building without any modifications because changes to their way of life necessitated adjustments to their residence. This was partly due to the traditional home's high maintenance costs. However, there was some temporary division due to the dissolution of families, so 50% of looms were traditional pit looms and 50% were wooden with steel spool loom machines. Most looms also have Jacquard machines installed for better and easier designs. shows the space requirements for raised pit looms and pit looms in the ground. For the equipment to fit the looms and their components, the space must have a minimum height of 4 meters.

**Climate response and spatial analysis of workspaces:** The planning includes fundamental concepts of climate-conscious architecture, such as housing orientation, cross-ventilation provisions, use of suitable building materials, etc. **Orientation** The houses are arranged in a north-south direction. Because the longer east and west walls are shared by the neighboring homes and are not exposed to solar radiation, the heat gain is decreased. However, some of the homes have been split in half, with one half being used and the other being either demolished or left alone.

**Buffer spaces** shaded spaces like the front veranda with the thinnai act as buffer spaces, reducing glare and doubling as comfortable spaces for social interaction. But in converted traditional houses with concrete roofs along with brick walls were not leaving any verandah / thinnai like space instead they are leaving a space for leaving their foot wares, etc. So, in altered houses we cannot find any buffer space in front of their house.

**Courtyards** Since Negamam is surrounded by mountains, they have a warm and cold environment, which results in greater rainfall and frequent breezes. They are not found in any type of housing due to this location's climatic conditions.

**Cross ventilation** Traditional homes have straight doors and openings from the thinnai to the door leading to the backyard, allowing for cross ventilation. Cross ventilation is aided. Due to the inadequate natural lighting conditions in this style of dwelling, cross ventilation is not possible in changed homes.

**Building materials** Brick and lime plastered walls, which are permeable building materials, are used in traditional homes to maintain the thermal comfort of the occupants. They take in moisture and keep the workplace's humidity levels at a healthy



level. By doing this, the yarn is kept from breaking. Traditional homes have cement flooring, which makes it easier to dig trenches for weaving. The heat conditions in converted homes will be worse than in traditional homes, making it impossible for weavers to work continuously without any aiding equipment like fans or air conditioners.

**Building details:** Typology 01

Sandhya residence,

location: Periya negamam, occupant: 3nos

Area: 357.5 sqft, Weaving machine: 1no

Weaving place area: 63 sqft

Lighting environment: artificial light

Building typology: Traditional, Mangalore tile house.

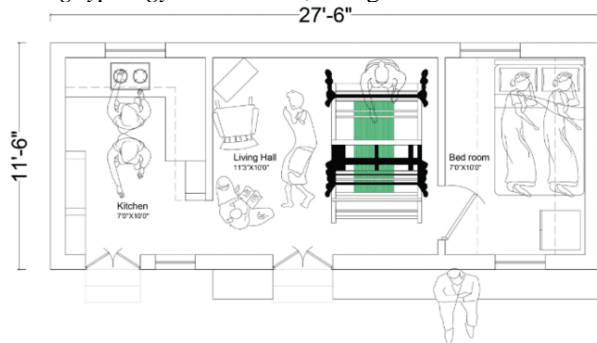


Fig 7 : typology 01 floor plan(Author)



Fig 8 : typology 01 images (Author)

**Building details:** Typology 02

Muruganandam residence,

location: Periya negamam, occupant: 5nos, Area: 585 sqft

Weaving machine: 1no small, Weaving place area: 96 sqft,

Lighting environment: artificial light

Building typology: Altered, contemporary house.

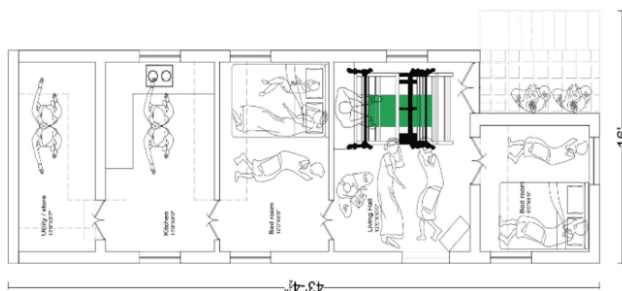


Fig 9 : typology 02 floor plan (Author)



Fig 10 : typology 02 images (Author)

**Building details:** Typology 03

Magendhran residence,

location: Periya negamam, occupant: 6nos

Area: 1480.5 sqft, Weaving machine: 2no dug machine.

Weaving place area: 368.5sqft

Lighting environment: natural light

Building typology: Traditional, Mangalore tile house.

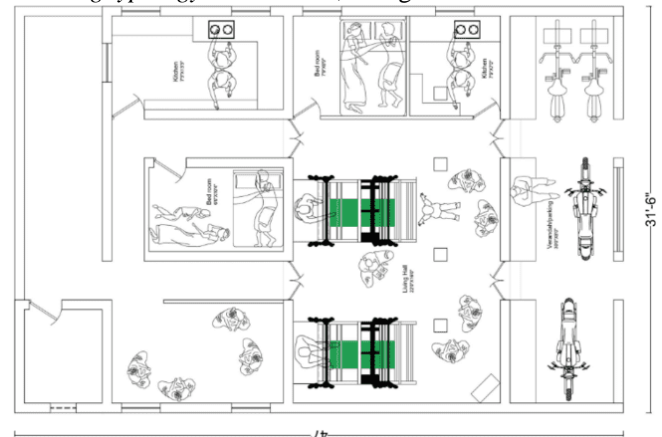


Fig 11 : typology 03 floor plan(Author)



Fig 12 : typology 03 images (Author)

### 3. Pillayarpalayam, Kanchipuram, Tamil Nādu

The grid-patterned designated weavers' zone is mostly made up of residential land use. Agraharam's main attractions are its temples. East to west is the direction in which the street is aligned. Large platforms known as thinnai line on the outer walls and stretch towards the street. On the sloped roof, these are protected by long eaves. Well-known Andhra Pradesh weaving communities, the Devangas and Saligars, came to Kanchipuram, where the flooring is primarily made of red oxide. This community includes 28 cooperative societies.

**Modes of production:** The structures of the weavers' homes have undergone some modification, but the methods of manufacturing remain the same. Traditional production methods

that are still in use include the use of pit looms, wooden spools, and street sizing. But acid and synthetic dyes have taken the role of natural dyes. The bulk of weavers stick to the traditional designs, while a very tiny number have begun to computerize their designs. There are five main phases of weaving: dyeing and degumming, warping, street sizing, wafting, and weaving.

**Dyeing and degumming** these activities are held in dyeing centers 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.

**Wafting** 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. space of 2.5 m<sup>2</sup> is required for this activity.

**Weaving** Because they are more effective and have superior moisture management, classic pit looms are preferred by weavers. The majority of looms are equipped with jacquard machines, which are tools for weaving looms that make it easier to weave intricate patterns and designs. shows the space requirements for raised pit looms and pit looms in the ground. For the equipment to fit the looms and their components, the space must have a minimum height of 4 m.

**Climate response and spatial analysis of workspaces:** The planning consists of 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 act as buffer spaces, reducing glare and doubling as comfortable spaces for social interaction.

**Courtyards** Courtyard's, 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.

**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,** Brick and lime plastered walls, which are permeable building materials, maintain the thermal comfort of the inhabitants. They take in moisture and keep the workplace's humidity levels at a healthy level. By doing this, the yarn is kept from breaking. Mud serves as the flooring in traditional homes, making it easier to dig loom pits. Regular applications of a moist mud and dung combination to the flooring serve to keep termites and other insects from damaging the organic silk thread.

#### Building details: Typology 01

Murugan residence,

location: Pillayar palayam, Kanchipuram

occupant: 4nos Area: 1267 sqft

Weaving machine: 1no traditional wooden machine Weaving place area: 140 sqft

Lighting environment: natural and artificial light

Building typology: Traditional, Mangalore tile house.

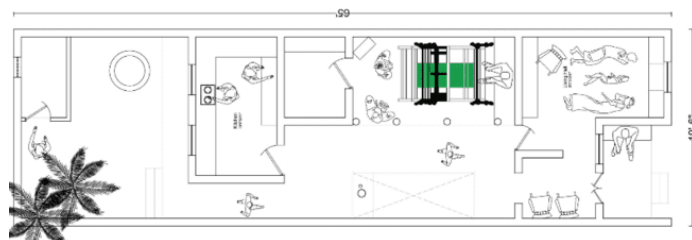


Fig 13 : typology 01 floor plan(Author)

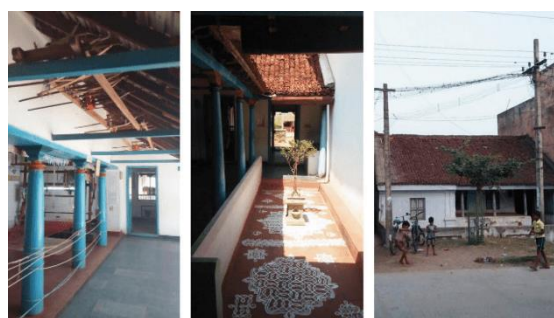


Fig 14 : typology 01 images (Author)

#### Building details: Typology 02

Sathya Jothis residence,

location: Pillayar palayam, Kanchipuram

occupant: 3nos Area: 764 sqft, Weaving machine: 1no big

Weaving place area: 148 sqft

Lighting environment: Natural & artificial light

Building typology: Traditional, Mangalore tile house.

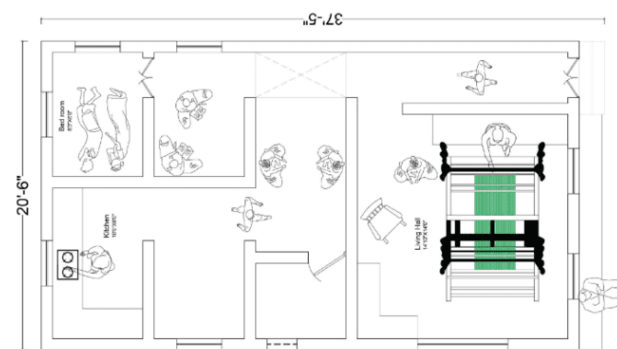


Fig 15 : typology 02 floor plan (Author)



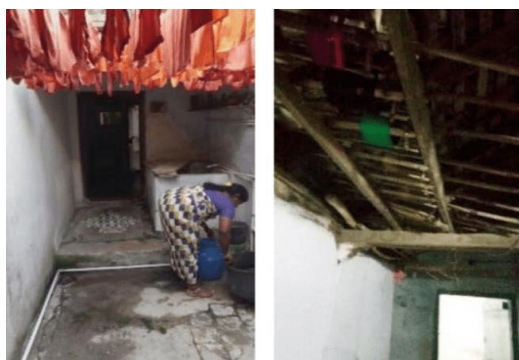


Fig 16 : typology 02 images (Author)

CASE STUDY COMPARATIVE ANALYSIS													
S.NO	LOCATION	TYPOLGY	ORIENTATION	COURTYARD	NEIGHBORHOOD	CLIMATE	CRISIS	TRADITION	AREA	LOCAL	WILDLIFE	CONSTRUCTIVE	GOVERNMENT
1. Periyar nagam, Kanchipuram													
RESIDENTIAL													
1	Typology 01	NS	YES	YES	None	YES	140	120	Good	Traditional old	Traditional old	Traditional old	Co-operative
2	Typology 02	NS	YES	YES	None	YES	140	120	Good	Traditional old	Traditional old	Traditional old	Co-operative
2. Periyar nagam, Thanjavur													
RESIDENTIAL													
1	Typology 01	NS	NO	YES	Visual &	NO	80	100	Average	Traditional old	Traditional old	Traditional old	Private owner
2	Typology 02	NS	NO	NO	Visual &	NO	80	100	Average	Traditional old	Traditional old	Traditional old	Private owner
3	Typology 03	NS	NO	YES	Visual &	YES	80	100	Average	Traditional old	Traditional old	Traditional old	Private owner
3. Periyar nagam, Thanjavur													
RESIDENTIAL													
1	Typology 01	NS	NO	NO	Visual &	NO	120	120	Poor	Traditional old	Traditional old	Traditional old	Private owner
2	Typology 02	NS	NO	NO	Visual &	NO	120	120	Poor	Traditional old	Traditional old	Traditional old	Private owner
3	Typology 03	NS	NO	NO	Visual &	NO	120	120	Poor	Traditional old	Traditional old	Traditional old	Private owner

Fig 17 : comparative analysis chart (Author)

**III. Contribution of HRIDAY:**(heritage city development and augmentation development) The Ministry of Urban Development distributes funds for the HRIDAY initiative, which was created by the Indian government. It strives to inclusively integrate urban planning, economic development, and heritage preservation. The central government of India has designated Kanchipuram as one of the twelve cities covered in this program. Four temples and a weavers' zone are among the five locations in Kanchipuram that have been designated as heritage zones.

**IV. Contribution of co-optex:** The Co-optex Society is a key player in the handloom and machine weaving industries in Kanchipuram. This society provides raw materials and the designs that weavers need in exchange for a wage. This society will take responsibility of supplying and promoting the finished products after purchasing the woven saree from the weavers and stamping it with the kanchipattu seal. This organization will address the issue facing weavers, and it has a formalized community body to communicate with the state government to fulfil the necessary tasks. Additionally, this society will give loans to weavers in order to support their growth. Most of the weavers in Pillayarpalayam are connected to this community.

## V. CONCLUSION:

To conclude, From the study and analysis of hand loom weaving in different location of Tamil Nadu, the Traditional pits were been constructed for living and as well as for the handloom weaving with the sustainable material are perfect

adaptation for this handloom weaving works, because of handloom weaving is the job which requires at least minimum of two persons to work for whole day to complete three quarter of a silk saree, and a men/women need to sit on the pit and he/she needs to use the legs and hands to weave, legs needs to peddle to shift the next thread(paavv) and the hands are required to change the silk and Stritch the layer. The working environment and climatic conditions in traditional weaving places are found to be good and it has effects to maintain the quality of silk compared to the weaving place of contemporary building. Spatial elements like the presence of courtyards in traditional houses which helps to receive natural light and good thermal maintenance inside the weaving place, and this space used for some other activity like yarning, threading, wafting, etc. The weavers use courtyards to dry the silk threads after dyeing. Compared to Thirubhuvanam, Kanchipuram. Periyaneagamam is also a traditional weaving place but in negamam the ratio of weavers in the past 10 years has been reduced and the typology of the houses has been changed. This found because of they are not get connected with any government society and sectors they were been working for private owners and they are not getting proper wages to run this occupation as generation and also due to family extension they tends to split the house in to two or three, for that they need to do changes in house so they directly dismantle the traditional setup and they gone for cement and concrete building which are found not a suitable working environment for weaving. And in Thanjavur the weavers have completely changed their weaving setup and working environment because of they also not connected with any society and next generation persons were not interested to take this job as mainstream, and the weavers were, mostly above 60 aged people were doing this handloom weaving for private orders and, they are weaving very simple sarees. In Thirubhuvanam and Kanchipuram Co-operative society plays a major role for the weaver's development, and HRIDAY has moved one step forward to conserve the Pillayar palayam weaving zone in Kanchipuram, because of in Tamil Nadu very few places were following traditional weaving method in their own traditional old house / working place that are made for purpose of weaving. v Government needs to establish a committee to take a step ahead on diminishing Hand loom weaving in a place like Periyaneagamam, etc because once a time this place was very famous for this hand loom weaving, but now next generation peoples were not getting interest to continue this job because lack of improvements to this sector and by private owners. The government can allot fundings and provide loans for this location and Thanjavur location to improvise and motivate the weavers to set up or to maintain a proper weaving environment. v Conservation activity can also be done for this location to motivate the weavers. v Some of the Architectural design solutions can also be implemented in their working environment.

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