

# Heritage Conservation of the Vernacular Weavers' Settlement

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**Abstract**—Odisha the land of enriched cultural heritage and traditions has a vast reservoir of vernacular architecture and indigenous knowledge existing in rural society. Nuapatna, a block in Odisha famous for its Khandua handloom and reflecting the rich cultural heritage of Odisha, is struggling for survival owing to competition from cheap machine made products.

*Not only the Khandua weaving, but also the traditional housing settlements of Nuapatna faces the threat of extinction because of housing schemes under Affordable Housing (like Pradhan Mantri Awaas Yojana) which are neither climatically, functionally or culturally suitable. The traditional houses reflects their way of life and the various activities they perform in the process of the weaving. This paper aims to draw attention to the fact that weavers settlement of Nuapatna have been built in response to the living and cultural pattern and occupational needs and there is an urgent need to conserve these vernacular settlements.*

## 1. INTRODUCTION

Odisha the land of enriched cultural heritage and traditions, has a vast reservoir of vernacular architecture and indigenous knowledge existing in rural society. Vernacular settlements can be defined as basically habitats comprising of open, semi open and enclosed spaces forming a pattern reflecting the customs, lifestyles, history, social structure, economy, climate, material, technology of a particular community. The layers thus formed become specific to the place and also create the identity of the settlement.

In Odisha, vernacular architecture still exists and people are still using vernacular architecture with some indigenous technologies. The vernacular forms for building are those that have existed in the region in their primitive forms, for example, a sloping roof surface to bear rainfall, mud walls that keeps out the heat of the sun, or an internal courtyard that makes the shaded open space.

Khandua silk saris of Nuapatna village are very famous in all over India for its excellent workmanship, design and colour combination. Nuapatna having about 5000 weavers with more than 3000 looms is such a natural cluster having vernacular built forms of the weaver community in Athagard sub division of Cuttack district of Odisha.

Nuapatna art reflects the rich cultural heritage of Odisha but is struggling for survival owing to competition from cheap machine made products. The traditional houses which reflects their way of life and the various activities they perform in the process of the weaving also faces the threat of extinction because of housing schemes under Affordable Housing, like Indira Awaas Yojana (IAY) which are neither climatically, functionally or culturally suitable. This paper aims to draw attention to the fact that there is an urgent need to conserve the vernacular weavers settlement of Nuapatna which have been built in response to the living and cultural pattern and occupational needs of the weavers.

## 1.2 HISTORY AND BACKGROUND IMPORTANCE

The Nuapatna cluster has prominence in the Indian silk industry and is one of the three potential places of Tassar production areas of the country after chapa in Chattisgarh and Baghalpur in Bihar.[4] The Tassar production and weaving of Tassar blended fabrics was in its peak for a period of three decades i.e 1965 to 1995[3]. The main produce at the cluster was tussar yarn and blended fabrics and furnishings. But due change in forest department policies for Tassar cultivation, change in trends of consumption and ban on Indian Textile exports into Germany and other European Countries on Eco-friendly grounds, there was a shift from Tassar blends to Mulberry Silk saree and also the tie and dye technique on cotton and cotton yarn used in border warp Ikat and in pallav, weft Ikat, the weaves of the cluster had diversified to weaving of low cost silk saree targeting local and state domestic markets looking for a cheap variety of Mulberry silk saree that is generally available at this cluster.[2]

Tie and Dye technique on cotton in Nuapatna (Tigiria) area started in the 20th century. The technique in Nuapatna has reached a high level of development and craftsmanship. In weaving of silk fabrics sometimes cotton yarn is used in border warp Ikat and in Pallav, weft ikat. The technique produces motifs in their natural curve form and geometrical motifs which are very rarely seen elsewhere.[1]

Nuapatna occupies a distinct place in the handloom map of the state. With a population of 7000, Nuapatna has 5000

registered weavers with 2183 looms, 22 cooperatives for the weavers, 20 self help groups, 29 master weavers, 364 tie and dye helpers, 2 technical assistants and 11 sizers. Five national awardees have brought laurels to the weaving cluster of the locality.

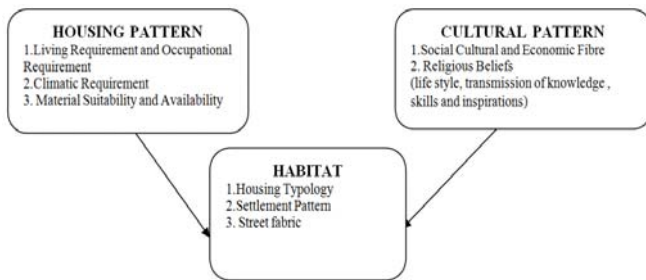
## 2. OBJECTIVE OF STUDY

The objective of the study is to study the vernacular settlement of the weavers which has evolved in response to the living and cultural patterns and suggest steps to maintain and conserve this heritage. When we study the reasons for the decline of the handloom industry in Odisha we see a lot of focus has been to the absence of marketing, credit and yarn inputs but an important sector which has been overlooked is the dilapidated living condition of their homes and civic amenities which intensifies their exodus rate to urban areas for alternative employment. A more sensitive and sustainable approach by understanding the tangible elements i.e. living pattern (housing typology, housing clusters, building materials influenced by climate) and intangible elements (life style, transmission of knowledge, skills and inspirations) is needed to prevent the further decline of the handloom industry.

## 3. METHODOLOGY

The methodology of the study will involve :

- A. Study of the history and background of Khandua handloom to understand the stakeholders and the process of ikkat handloom weaving.
- B. Effect of Living Pattern and Cultural Pattern on the habitat of the vernacular settlement.



## 4. STUDY OF NUAPATNA HANDLOOM CLUSTER

### a) Location

The village Nuapatna is located at a distance of about seventy kilometers from the city of Cuttack and about hundred kilometers from Odisha's capital city of Bhubaneswar. It is well connected with good weather motor-able road with both the cities.

### b) Weaving Process In Nuapatna



### Washing Of The Yarn

The yarn is 'Malda Yarn' bought from the market and before it can be used to process it into a fabric it has to be washed. The fibers are soaked in lukewarm water (or preferably cooler water) containing detergent and left for about an hour. Following that the water from the sink is drained out and the hanks, one at a time, are rinsed with utmost care to wash off the soap. It is then gently pressed to ooze out the water. The yarn is left to dry out on drying racks. The hanging action helps the yarn dry straight.

### Tying

Tying is the process where a plastic is wrapped around the yarn with the help of rubber. It is tightly tied as per the design so that those areas stay as it is without being stained while the process of dyeing is carried out. The frame is about 6'x4' and the artisan sits on the floor and ties. Since it is an intricate process it requires a lot of light and therefore natural light is preferred at a convenient level. Tying is done in their verandah or in the room attached to the verandah that has openings.

### Dyeing

Dyeing is the application of dyes or pigments on textile materials with the objective of achieving colour with desired fastness. Dyeing is normally done in a special solution containing dyes and particular chemical materials. Yarn dyeing is used to create interesting checks, stripes, and plaids with different-colored yarns in the weaving process. In yarn dyeing, dyestuff penetrates the fibers in the core of the yarn. Cotton is dyed with a range of dye types, including vat dyes or is naturally extracted from plants and heated to give the colour permanence. In order to create a stronger pigment or a more permanent colour for the fabric, the pigment is heated in the room and the process releases gas. This gas needs vent to escape from the room in order to avoid suffocation.

## Winding

Winding is the procedure where the hank is transformed to a linear form, the warp. Dyed hank yarn is wound on to pirn with the help of charkha. The pirn is used to load yarn into the warping drum. There is a wheel and a metallic shaft, which are connected with each other with the help of rope for transferring motion. The hank is mounted on the wheel and the pirn on the shaft. The yarn from the hank is transferred on to the pirn by rotating the wheel.

This process can be carried out in a much smaller space. Each charkha requires a minimum space of 5' x 2' and the total area would be approximately 6' x 4' which will allow the artisan to comfortably wind the yarn into the pirn. In the artisans' language the pirn is called the 'nalli' and the holder is called the 'manku'. The artisans of Nuaptna wind in the verandah because the space allows easy hand movement.

## Warping

Warping is a process, which converts the hank yarn into a linear form to give the length on the loom. Warping is done on a huge drum and the width and desired quality of the product is decided at this stage. The drum also helps to calculate number of threads and the length of the warp. These threads form the base for the weft. For a 46 inch wide fabric, over 3200 individual yarns run along the warp of the fabric. The process of warping is carried out in a room having an area of about 20' X 16'. The room has a puncture given in the roof through which natural light penetrates. The process requires one person to rotate the drum and another to help. The hank yarns of the desired colors are set in a frame of rows from which the thread is drawn and takes about a space of 12' in length and 9' in height.

## Sizing

After warping is done, the warp is stretched out and sizing material is applied to add strength to the yarn and lubricate it to withstand the rigors of weaving. Natural adhesives like rice, maize, wheat flour or potato starch are used. This activity of starching the yarn for weaving is known as "sizing". This starch in the yarn is removed only after two to three washes of the woven product.

The Nuapatna cluster follows a method called 'street sizing'. This requires a huge open area of about 200m. Typically, depending on the warp length, three to four persons are needed to carry out sizing. The open area provided in the design must be 6' wide and 300m long. In this way it will allow any length to fit in.

## Weaving

Weaving is the process of interlacing two sets of yarn—the warp [the longitudinal threads] and the weft [the horizontal threads]. The equipment that facilitates this interlacement is the loom. A handloom is a loom that is used to weave fabrics

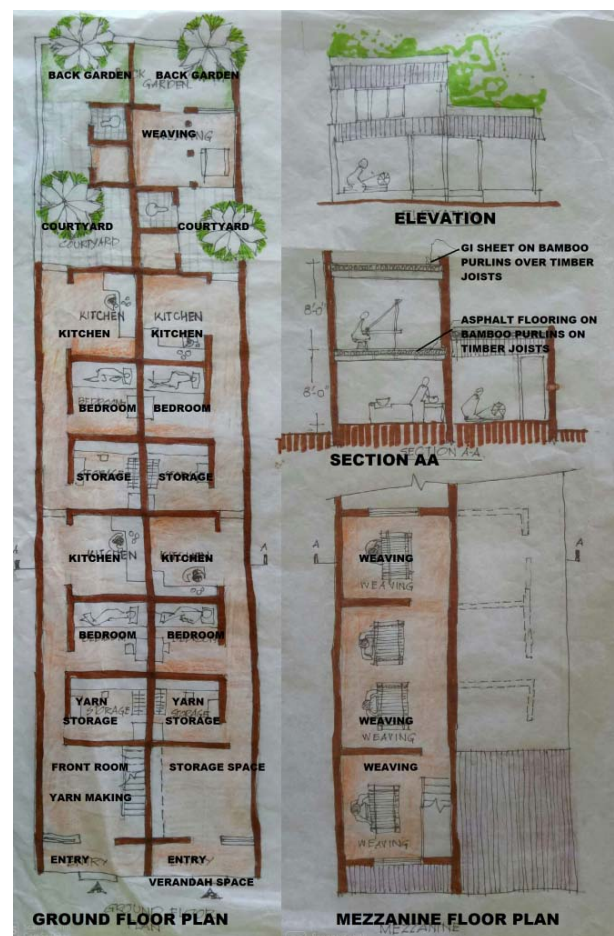
using the hand and feet. This finally produces the beautiful fabric. Weaving produces an average of six pieces of fabric a month, each pieces measuring a length of 5m.

Pit loom, stand loom & frame loom are three kinds of looms used by weavers. The Pit loom is a loom that has a pit having two peddles set in the pit for the weaver to operate. This is considered to be better weaving as the fabric woven retains the character of the fibre and fabric due to the proximity to the ground. The ground absorbs the tension and speed and makes the fabric more breathable.

## 5. LIVING PATTERN

### a) Living Requirement And Occupational Requirement

The Plan of a weaver's house has developed from the livelihood needs of the inhabitants. The houses of craftsmen are examples of vernacular architecture, where the architecture has evolved over a large span of time. Built from local materials and available technology, they aptly cater to the living needs and occupational needs of the craftsmen. Every member of the family is involved in the process of weaving and most of the time is spent in the weaving room, the largest of all the rooms.





During construction, attention is given to details pertaining to functional needs, such as positioning of pits built into the floor of the house for placing of the weaving looms, and lighting requirement for the loom through window/ skylight. Wet areas for handling dyes are open-to-sky for sunlight. Similarly, details are incorporated for yarn preparation, such as a peg at the end of room for passing the yarn while weaving, niches at a low level for keeping weaving-related articles, and storage spaces for threads.. Platforms built outside the houses provide additional work areas and for stretching yarns.

Architecture also serves as an inspiration to the craftsmen. The motifs on sarees are largely inspired by ornamentation on buildings. The vernacular houses provide maximum flexibility and adaptability to the local environmental conditions as well as meet social and cultural requirements. The courtyard has multiple uses like drying of crops, winnowing, cloth weaving and children's playing space.

The houses are linear with a corridor and rooms arranged sequentially along the corridor. Since the houses are arranged in row-housing there is no light and ventilation to habitable spaces or in the workspace i.e looms. There are skylights in some places. Since they have a joint family system there are 2 or more family sharing the same linear house with their individual kitchens. In some houses work spaces are on first floor or as a separate unit with a courtyard separating the living areas and workspace. The verandah is designed in the east direction to get maximum light and to avoid the glare and the courtyards generally face west. There is no piped water supply in the cluster and most of the water is ground water which is hard water that affects the dyeing. During the rainy season the villagers mainly rely on weaving for subsistence but the leaking roofs cause hindrance to the weaving activity.

#### b) Climatic Requirements

The courtyards allow for air movement which is very suitable for the hot and humid climate. Since only 60% of the weavers have electricity, most of the drying activity is carried out in the room.

Dyeing is carried out in the courtyard of some of the assigned houses of the cluster. It is oriented towards the west for maximum sunlight. This is because after the yarn is dyed and is put outside for drying which is why west is preferred. Dyeing is quite a cumbersome process and the right equipments and facility plays an important role. For example, it is integral to have a source of water nearby and a clear drainage system to drain the dye right after dipping it.

#### c) Material Suitability And Availability

The walls are made of brick or laterite stone with lime plaster and the roofs are timber joists with wooden/bamboo purlins. The roof on the ground floor are asphalt on bamboo purlins and timber joist. In the first floor corrugated GI sheets are placed over the bamboo purlins. All material are locally available, climatically suitable for the hot weather and well within the budget of the weavers. During the rainy season

however there are leakage problems from the roof due to maintenance problems in some houses.



## 6. CULTURAL PATTERN

### a) Economic , Social And Cultural Fiber

The average working day of a weaver is 280 to 300 days per annum and an average worker earns Rs 2000 to Rs 3000 per month. Wages vary from Rs 80 to 100 per loom. Majority of the population are illiterate and semi literate. Most of the households are five member families and 50% of the weavers belong to the BPL (below poverty line) category. A large majority of the villagers belong to the OBC category.[7]

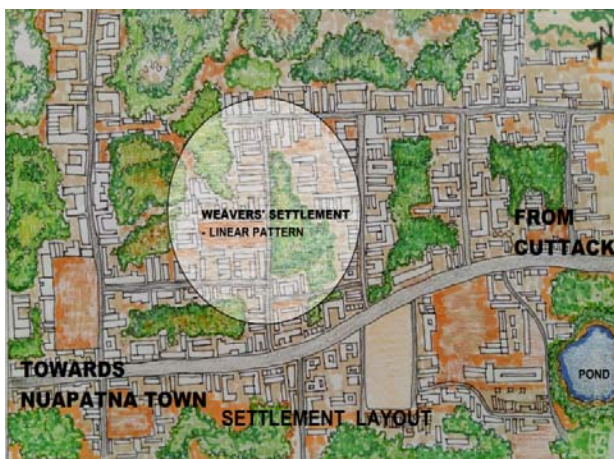
Home-based system of weaving, allows knowledge transfer from seniors to younger ones in the family through traditional methods of knowledge transfer. Most of the members learn basic hand weaving from their parents at a young age. When one member weaves sitting in a mangaa, others help him filling the phui, which carries dyed weft threads for the required design. The weaving work is community-based in a collaborative style. The working environment has specialty of socialization and knowledge-sharing among members of the community. Through traditional methods of teaching, storytelling, observation and minor documentation, such knowledge is transferred down the generations. This unique knowledge is shared with son and daughters by father and senior members; by practicing together and internship; by experimentation; Informal and collaborative learning takes place through community of interest and community of practice, job sharing, open discussion, and socialization. The weaver-members or shareholders of the community don't have any superior-subordinate feelings; rather they behave as members of one family. Thus the sharing of knowledge and skill is informal and the knowledge workers share it without showing any sort of possessiveness.[6]

In almost every village group, women are seen doing ancillary work of weaving. Women members in the family are found to engage themselves in weaving activities, in addition to doing all the basic household work. In case of households who are exclusively into weaving, after lunch time the members are seen to be in relaxing mode, exchanging ideas and information with others in the locality, spending some time in gossiping with them, and doing some tasks from the secondary work, if any. For those, where weaving is not a primary occupation,

women members in the family prepare the ancillary things required for weaving during the day time, and the male members in the family usually do weaving after they return from farm.

### b) Religious Beliefs

The Ikat weavers of Nuapatna belong to a traditional community, producing the long-established unique handloom art for generations.[2] Nuapatna village in cuttack district of Odisha is famous for the religious textile – Geeta Govinda which was inscribed with 12th century poems of Jayadev. In this village weaver's community were specially commissioned to create Khandua pata (silk cloth) for Lord Jagannath. The age old tradition of khadua pata is a living tradition because the communities have retained this practice till date as their legacy. It is the only kalika vriti –legacy, which weavers have inherited from their ancestors. The process of ikat creation begins from visualisation to translation of patterns into threads inside the weaver's abode and this weaving has reached to high level of development and ornamental designs reflecting tradition and cross cultural linkages. Main products include cotton and silk varieties of the sarees, lungis, dress materials, napkins, stoles and dupattas.[5]



## 7. SETTLEMENT PATTERN

There are a number of linear settlements along the road. Each house is around 12 feet width along the road and depth is more than 200 feet. There are house drains carrying rain water running from the common wall inside the house which empty into the street drains. The ground topography allows for easy drainage and hence there is no water flooding even in the rainy season.

## Housing Typology



## Street Fibre

The streets are mostly oriented in North- South direction and there are community spaces on the street where the sizing for weaving is done. The Nuapatna cluster follows a method called 'street sizing'. This requires a huge open area of about 200m. Typically, depending on the warp length, three to four persons are needed to carry out sizing. The open area of 1.8m wide and 300m long allows for sizing to take place comfortably. In this way it will allow any length to fit in.

## 8. GOVERNMENT POLICIES

All the interventions at central level are made for the economical up gradation and none of them focuses on the housing sector of weavers though weaving is a home based enterprise. For the weavers, work is the main priority. So, in case of weavers any government scheme without considering work place within the dwelling unit will be a failure. The IAY (Indira Awaas Yojana) and PMAY (Pradhan Mantri Awaas Yojana) are a failure in the rural home based enterprises of weavers' settlements because of 2 reasons:

- 1) Common Dwelling Unit layout for home-based enterprise and non home-based enterprise, though both have different requirements.
- 2) Dwelling unit layouts are not climatically suitable or sustainable because of the use of RCC which produces higher indoor temperatures.

## 9. INFERENCES

There is an urgent need to conserve the vernacular weavers settlement of Nuapatna which have been built in response to the living and cultural pattern and occupational needs of the weavers and are sustainable. However certain safeguards have to be maintained:

1. Plot area less than 65sqm of area should not be permitted for mix use i.e residential and weaving activity. There should be an open courtyard of mm 15sqm (mm 3m wide), if setbacks are not given. 25sqm is the minimum living area norm specified in national housing code. We cannot challenge the nationally accepted norms, but can made some addition of separate work space of min 10 sqm for the weavers and also inner open space of min 15sqm, as the weavers settlement area is based on courtyard planning.
2. The houses should be maintained to take care of light and ventilation and prevent leakage during rainy season.
3. Proper land records can be there with the authority which is absent in present scenario because of continuous sub division of plots. Each owner of the dwelling unit will have proper property document which will help them in taking loans from banks. Provision of minimum social infrastructure required for a particular cluster can be fulfilled.

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