

# Transformations of Vernacular Buildings of the Rural Areas in Chhattisgarh: The Case of Ektaal Village, India

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## Abstract

Vernacular architecture is an outcome of people's relationship with their dwellings and environment, it usually is a living example of a region's cultural and social beliefs. However, the recent impact of industrialization and globalization have initiated a change in most vernacular settlements around the world. The changes in the global markets have also initiated changes in both urban and rural built environment. These changes however are taking place in different stage and time. The study discusses the stages of changes in the vernacular buildings in terms of its spatial planning, use of materials, and construction technologies.

It employs a case study method involving structured interviews of the residents and observations of their dwellings.

The study identifies the buildings in five different stages from vernacular to complete new buildings. It thus provides a primary understanding of the planning of residences, use of materials, construction techniques and social lifestyles of the dwellers in Ektaal, India.

**Keywords:** Chhattisgarh, Rural, Transformations, Tribes, Vernacular Architecture.

## Introduction

Vernacular Architecture refers to local culture, material, and craftsmanship. It represents the built environment as one with nature. India has different climatic zones and geographical background is a house to various style of vernacular. However, due to the changing landscape, climatic shift, availability of materials and redefining culture, there is a change in the existing vernacular architecture and traditions in rural areas, towns, and regions (Hermida, 2020).

Transformation in architecture drives changes in the living conditions, lifestyle and therefore indirectly bringing a change in the cultural and social practices (Jagatramka, et al., 2021). Vernacular has always been characterized by ongoing improvement and modification, representing the traditional materials, culture, and innovation in craftsmanship. These changes until recently have been in accordance with the surrounding environments and cultural

traditions of the people. The dwellers have adapted the changes effectively, but it is important to comprehend how long these changes will last to preserve the vernacular and trace the changes it is necessary to understand the sustainability and suitability of these construction. (Radivojević, et al., 2017; Dayaratne, 2008; Kotharkar & Deshpande, 2012).

The aim of the paper is to map the transformations in vernacular buildings in Ektaal village. Its objective is to identify the various stages of transformations of the buildings in terms of spatial planning, materials, and construction techniques.

### **Review of Literature: Transformation of Vernacular Architecture**

Vernacular architecture can be defined as a practice of built form which is developed by the locals of a region, in response to the climate, availability of material, type of craftsmanship or labour available, availability of technology, practices, and learnings passed through generations, to create individual spaces and settlements which ensure physical functionality, beauty, low-energy use, comfort, durability, and affordability (Foruzanmehr & Nicol, 2008) In today's scenario, vernacular is also influenced by globalization, ease of availability and low-cost materials, faster building technologies (Vellinga & Asquith, 2006).

Vernacular architecture has developed with the surrounding environment and the social and cultural lifestyle of the inhabitants and thus has always been assumed to provide sustainable built environments. The new material and construction techniques adopted by the inhabitants of a settlement are alien to the environment and have direct or indirect implications on the culture and social prospects of a region (Mirkar & Sharma, 2019; Thakkar, 2019; Widiastuti, 2013; Chuapram, et al., 2012).

The changes or transformations are mostly seen in the use of materials, construction techniques, planning. In few cases however, completely new constructions have taken place. The transformations have different phases of developments in the urban and rural areas. In urban areas, the rate of change is faster as modernization and infrastructural developments are happening at a faster pace leading to the detriment of indigenous or vernacular architecture. In rural areas, the rate of transformation is still slow and hence the vernacular architecture co-exists with the new constructions, along with few buildings which are at an intermediate stage (Kotharkar & Deshpande, 2012; Devadas, 2014).

Transformations have been seen in the change of traditional to modern styles. These changes have been studied by various authors using longitudinal and comparative methods of studies. The study of transformation from traditional to modern is further divided based on the following parameters: use of materials, construction technologies, spatial planning, and addition of new infrastructure. This paper elaborates the transformations in Ektaal Village of Chhattisgarh based on these parameters.

### **Research Methodology**

This research employs a case study method with observations and interviews as modes of data collection. The study is based on understanding the various layouts of the settlements and dwellings using the comparative method. The context and the reason for transformations dominate the method of study. An initial observation of the village is done to map the different types of buildings under which the transformations are seen. These transformations are then mapped individually.

The houses in the village are studied and mapped using measured drawings to identify and record the original forms. This is done using the systematic observation method. The various stages of transformations are analyzed and recorded through structured observations. One to one close-ended interview with the residents are conducted to understand the changes in the built environment and the reasons for these changes.

The village of Ektaal is divided into two clusters with a total of 132 houses, of which 80 are considered for the study. These houses are selected using stratified random sampling, where the strata is defined through a reconnaissance survey. The interviews are conducted with the residents, through simple random sampling. A total of 200 interviews are conducted to analyze the reasons for these transformations.

Data collection for the study is done using google forms and measured drawings through sketches. Data is further processed on MS excel and AutoCAD. The data analysis of the transformation is based on simple percentage method which is used to identify the stages of transformations in the village.

### Ektaal Village

The Village of Ektaal lies 18km south of Raigarh. It is located at the border of Chhattisgarh and Orissa state. The village is 411.57 hectares in total area and has a household count of 271 as per the DCHB report (Directorate of Census Operations, 2014). Ektaal is surrounded by mountains and lakes, leading to the forest areas of Kanktura. The villagers speak Chhattisgarhi and Oriya. The village houses farmers and craftsmen alike. It comprises of the Jhara tribe and the Pradhans. There is a varied difference in the way of living of both the tribes as their lifestyles are governed by their occupations.



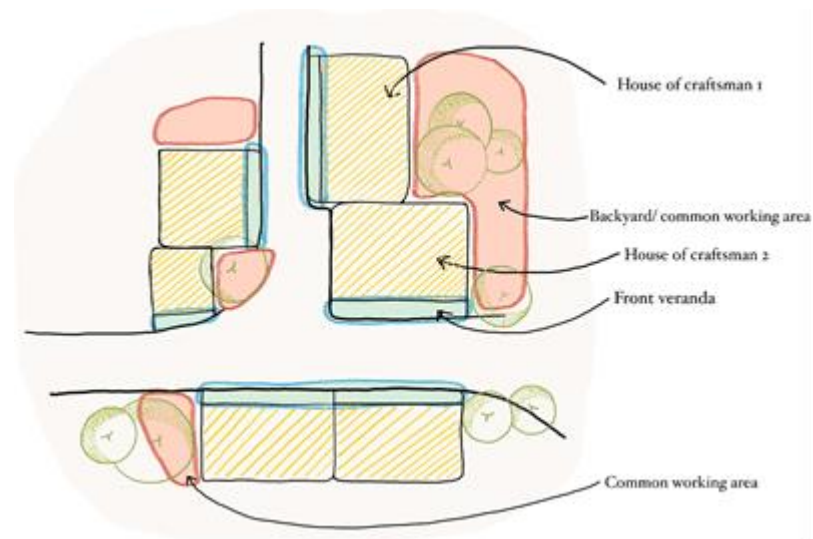
**Fig 1:** Layout of Ektaal village, Raigarh

Source: Authors

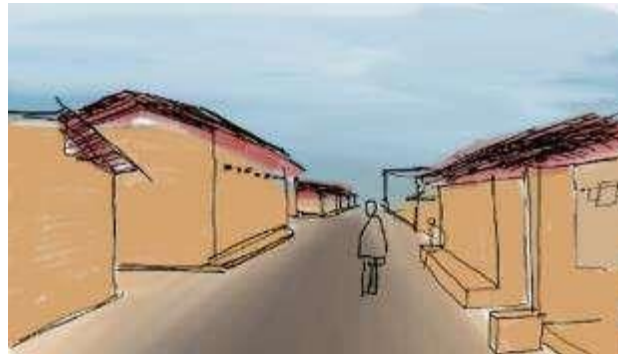
Pradhan's residences are used as dwellings only, where the Jharas have their workplaces within the houses. Both the houses vary in their use and layouts. Both the communities are placed at different 'Paras'(colony). These 'Paras' as settlements have evolved according to the lifestyles of their dwellers. Occupants of both the paras have their own assembly points for meetings and gatherings and schools in the vicinity are used for common gatherings. Both the paras have small water bodies towards the interior parts with small temples which provide sacred meeting spaces. The transformations in these villages also create changes in the meeting spaces.

The Pradhans believe themselves to be the initial and dominant dwellers in the region. There is very little communication between the two paras of the village as the difference in the lifestyles of both the castes differ significantly. Pradhan's para is clean, well-maintained and has turned towards Pucca houses, whereas the 'Jhara' para has little to no development. People live in very poor conditions. Even if the economic stability allows them to build better houses, they have not enhanced their ways of living (Fig 3).

Craftsmen's houses have been built with respect to their clusters where the backyard of each house and the by-lanes in between are used as workshop spaces specially for drying. There are small working spaces established by various NGOs working with the village which are placed within the cluster area, making it convenient for the craftsmen to use (Jagatramka & Prasad, 2021).



**Fig. 2:** layout of the houses in the Jhara para of Ektaal, Raigarh district  
Source: Authors



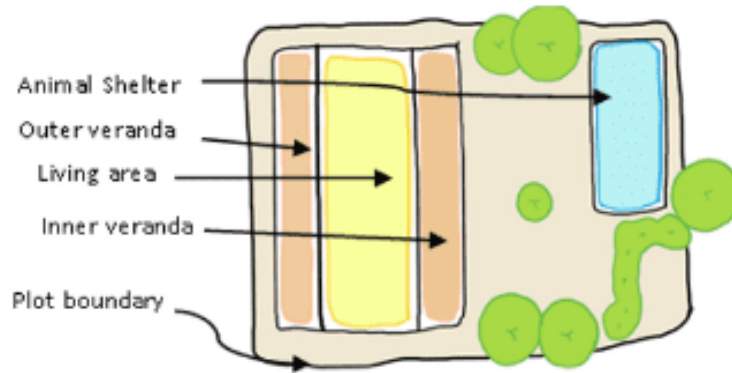
**Fig. 3:** Street view Jhara para, Ektaal  
Source: Authors

### Architecture of the Residential Buildings in Ektaal Village

Dwellings have been initially built by the people of the village themselves. Observations reveal that the construction styles and materials have been inspired by and constructed with locally available materials and tools. The materials seen in the oldest vernacular residences were mud, bamboo, and baked tiles. The houses in this village are single storied. The typology of houses seen in both the paras are different; hence the various characteristics of both the paras can be elaborated separately.

**Residence at the Pradhan Para:** The Pradhan para has 65 houses; most are owned by farmers. They are seen as both kaccha and Pucca. All houses in this village have courtyards around which the living spaces are planned. The details of the residential buildings are further elaborated as follows.

**Spatial Planning:** Houses in the Pradhan para consisted of dwelling units that are rectangular and consist of rooms with kitchens and animal shelters. There is a 'veranda' (Porch/ semi-covered space) locally known as 'Parchi' seen on the outside. The interior has the rooms and kitchen spaces. These verandas are used as working and gathering spaces in the dwelling unit. The rooms in the residence are typically 3mx4m in size. There is an animal shelter on the premises of the dwelling and the toilet units built recently are placed away from the living area sheltered around the trees, hidden from the living spaces (Fig 4)



**Fig. 4:** Zoning of a typical house in Ektaal Village

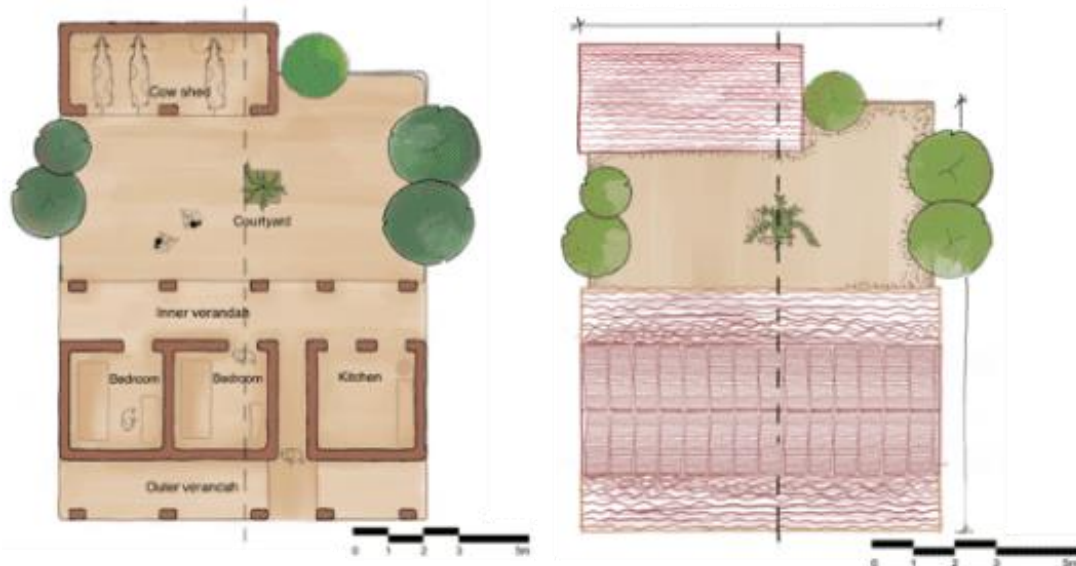
Source: Authors

**Flooring:** Houses are built of mud; the floors are regularly washed with cow dung slurry. The practice of applying cow dung slurry to the existing mud floors is to ensure cool and ambient temperature. Floors are decorated with various patterns and designs to mark the celebration of festivals or other special occasions.

**Walls:** Walls are built of rammed earth, finished with mud and cow dung slurry. Walls are built approximately 300mm thick. There are little to no openings in the external or internal walls. Walls are regularly maintained with cow dung application.

**Roof:** They are sloping and are made of timber and bamboo covered with baked tiles. They need maintenance with their coverings in every three-year interval. They have spaces to store grains, which also act as buffer spaces for air, used as simulation for summer and winter seasons (Fig 5 & 6).

**Doors and Windows:** Initially, there have been no doors. The change in the needs of security and privacy have led the people to use the doors, which are made of wood panels and sometimes of bamboo sticks. There are little to no windows and in case there are windows in the internal wall, it is a small opening covered with bamboo sticks. Windows are built as ventilation and hence, there are no shutters on the windows.



**Fig. 5:** Typical layout of the houses in Pradhan Para, Ektaal

Source: Authors



**Fig. 6:** Section through a typical layout  
Source: Authors



**Fig. 7:** Front view of a residence  
Source: Authors

Residences at the Jhara Para: Jhara Para residents are occupied mainly by the craftspeople. Houses have backyards and front verandas which are used to make bell metal craft (Fig 10). These are explained in detail as follows.

**Spatial Planning:** Houses are rectangular with spaces for living and kitchens. They have front verandas and the rear portion of the house is an open courtyard mostly used for drying and making crafts. Rooms are smaller with typical sizes of 3mx3m. Planning of a village is followed by the occupation of the dwellers. There is a marked difference in the houses of the farmers in the para and those of the craftsmen (Fig 8).

**Flooring:** Flooring is made of rammed mud finished with cow-dung slurry which is redone every alternative day. The mud floor helps to maintain the optimum temperature of the floor which enables the craftspeople to carry out their work during the day. Flooring is also used for drying the artifacts.

**Walls:** They are made either of rammed earth or with mud blocks, cow dung, and husk, plastered with mud and cow dung slurry. The walls in the area are typically built to 300mm thickness. Walls are maintained regularly with the re-application of cow dung to maintain the temperature and avoid chipping of the walls.

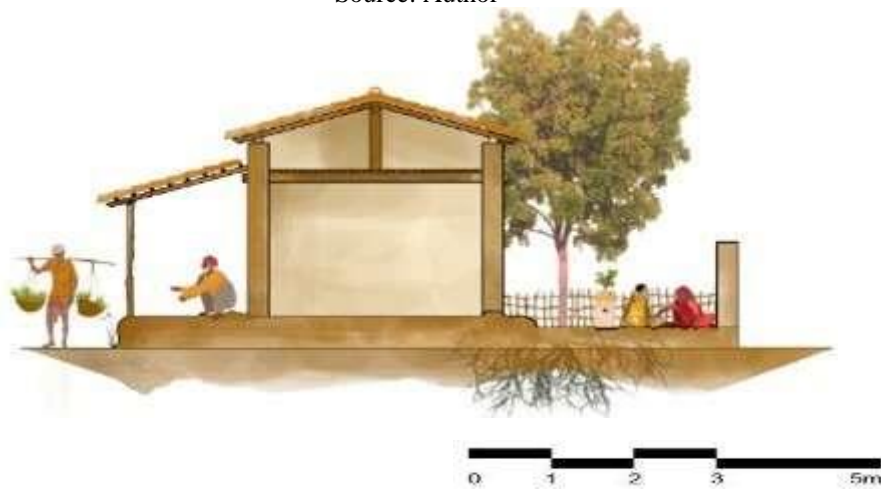
**Roofs:** These are made of timber and bamboo covered with baked tiles. Roofs are created at a height, the base of which is covered either with bamboo sticks or husk to create insulation. There are very small openings near the roofs for allowing hot air to pass. Husk used to insulate the interiors in the winter season is placed on the roof or stacked aside in the summer season (Fig 9).

**Doors and windows:** There are very few doors in the houses. Most of the houses only have an entrance door with no internal doors. They are made of wood and are small. Doors to the backyard or the rear door are sometimes made of bamboo sticks. However, in few cases, these doors are absent at the rear entrance. There are no prominent windows in the building.



**Fig. 8:** Typical layout of the houses in Jhara Para, Ektaal

Source: Author



**Fig. 9:** Typical section of a house at Jhara para

Source: Author



**Fig. 10:** Craftsmen working in the backyard of a house

Source: Author

### Transformation of Vernacular Houses

Various factors have led to the transformations of the vernacular houses. Few of the prominent factors observed are as follows.

1. Availability of funds through PMAYG
2. Convenience of procuring material
3. Need for more stable built forms

4. Reduction of maintenance of the houses
5. Need for bigger spaces to accommodate the growing families
6. Exposure to newer materials and technologies from the nearby cities, and
7. Ease of availability of labor for working the new materials

Although the transformations are evident in the villages, it has not happened at once. These transformations have taken place in different phases most of which can be observed in the different houses. To understand the stages in which the transformations of the houses have taken place, the research divided them into stages and related these stages in the various typologies of the houses observed based on their occupations.

The stages of the transformation of the houses can be identified as follows.

### **Stage I – The Original Form of the House**

Stage I of the transformation is the original vernacular form of the house built in Chhattisgarh, with a living space consisting of the room and kitchen, an open court in between and some cattle sheds within the premises. The center of the court has a Tulsi plant placed in the open, symbolizing the ‘brahma space’. Most of the houses belong to different castes and thus have small differences according to the belief systems. Although there are different castes, most of the villagers follow Hinduism and other tribal rituals. Some houses have external and internal verandas supported by bamboo poles and mud piers.

### **Stage II – Insertion of Doors**

In the initial phase of the layout of the house, there were no doors. The needs for safety and security, with the growth of the village have prompted the use of the doors. Doors are made of wooden frames and shutters.

### **Stage III a – Changes in the Materials of walls**

The transformations in most of the houses have been initiated with the changes in the wall materials. Walls made of mud require frequent maintenance as they would collapse due to the impact of the rains. The newer materials used for the construction of the walls are baked brick or fly-ash bricks, which provide a more stable structure. The walls are constructed in courses with either mud mortar or cement mortar. These walls are at times finished with mud plaster or cement plaster.

### **Stage III b – Changes in the Materials (Piers)**

Verandas have been initially supported with bamboo and on mud piers in few. With the change of the materials of the walls, the mud piers have also been changed to brick piers covered with cement plaster. Few of the houses have adopted RCC columns for the verandas.



**Fig. 11:** Change of the wall materials, use of brick piers and asbestos roofs

Source: Authors



**Stage III c – Changes in the Roof Materials**

Roofs of the houses are covered with baked tiles. These tiles require regular maintenance, but there are very few people in the villages with the expertise of working with the tiles. In search of better stability and affordability, the roof covering materials are changed to asbestos in most of the houses. The changes of the roof covering materials are widely seen on the veranda roofs.

**Stage IV – Introduction to Basic Infrastructure (Toilets)**

Houses in the rural areas have been provided with toilets as a part of a government initiative. However, the villagers have been reluctant to install the toilets and hence have placed them in the backyards, away from the living spaces. In most of the houses, the toilets are not visible from the courtyard too as they have been built away from visual access. They have been built with flat roofs.



**Fig. 12:** Toilets in the backyard

Source: Authors

**Stage Va – Addition of New Structures**

Houses have added new structures in their premises. These structures are built using modern building construction technologies and materials. The extensions are built with flat roofs, and most of them are made as RCC structures with brick walls and cement finished floors. Some of these new structures have been painted with vibrant colors. They have also been provided with all the modern amenities of lights and fans. New structures have been constructed on the site of the animal shelter which is either eliminated or relocated.



**Fig. 13:** Addition of a new structure

Source: Authors



**Fig. 14:** Completely transformed structures

Source: Authors

### Stage V b – Complete Transformation

In this stage, the houses have turned completely to new materials and flat roofs, which are slowly dissolving the initial identity of the village.

**Table 1:** Stages of transformation

Source: Author

	Stage I	Stage II	Stage III	Stage IV	Stage V
Settlement	Spread unevenly	Spread unevenly	Clustering of houses	Compact cluster of houses	Compact cluster of houses
Spatial Planning	Living area and kitchen along with animal shelter	Living area and kitchen along with animal shelter	Living area and kitchen along with animal shelter	Living area and kitchen, addition of living spaces	Living area and kitchen, addition of living spaces
Floors	Mud flooring	Mud Flooring	Cement Flooring	Cement Flooring	Cement Flooring
Walls	Mud walls	Mud Walls	Brick walls		
Plaster	Mud Plaster	Mud Plaster	Mud Plaster	Mud plaster	Cement Plaster
Columns/ support structure	Bamboo/ mud pier	Mud/ brick piers	Mud/	brick	Mud/ brick piers
Roof	Bamboo/ Timber with baked tiles	Bamboo/ Timber with baked tiles	Bamboo/ Timber/ GI pipes with Asbestos	Bamboo/ Timber/ GI pipes with Asbestos	Flat roof made with RCC
Doors	No Doors	Bamboo/	Wooden Doors	Bamboo/ Wooden	Doors
Windows	Clearstory Windows	Clearstory Windows	Clearstory Windows	Clearstory Windows	Clearstory Windows
Compound Wall	Not present	bamboo	bamboo	bamboo	bamboo
Animal Shelter	present	present	present	absent	absent
Additional Infrastructure	-	-	-	Additional living area	Additional living area

### Conclusions

The transformations observed in Ektaal village are an outcome of many factors. The extents and levels of transformations in every house differ. They are taking place gradually and the residents of the village are adapting to the new built culture at their own pace. It is observed

that almost all the houses in the village have started to transform and lie in between stage I-V. The materials used in the construction are easily accessible and available to the villagers. The transformations are adapted positively by the dwellers as it reduces the constant need for maintenance of the structures. Nevertheless, people are still tied to their cultural and social norms and are indifferent to the changes in the built environment.

The transformations have been happening over a long period. This slow pace in change has allowed for acceptance of new materials and construction technologies. Despite them being random and there are no norms or restrictions for the changes, there are no social disputes or cultural changes observed. They have introduced new technologies to the villages which they have learnt and have adapted giving them an additional opportunity for income and better infrastructure. Moreover, the use of modern construction materials has its advantages and disadvantages. However, the villagers have not only achieved a more stable material requiring less maintenance, but have also lost the sustainable way of living with the environment. This has unfortunately led to the use of various mechanical ventilation devices.

There is a distinct difference in the two different parts of the village due to the economic differences. The village illustrates the impact of economic, social, and cultural factors on the transformations of the buildings taking place. Transformation is a process that happens throughout. In fact, the nature of vernacular has always been of constant change and betterment and this village is no different.

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