

Transformation of Vernacular Houses – Causes And Scenario

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Abstract — There is a strong vernacular architectural character in the rural areas of India. The same was a result of time tested beliefs, climate, locally available building materials and socio-economic aspects of the respective regions. Vernacular architecture is a place is a reflection of culture, climate, building materials and building techniques of a time and the place. However, the present trend of globalisation and industrialisation has led to changes in various aspects like availability of building materials, urge to tide along with modern building styles as well as construction techniques, lack of skilled human resources who can execute old construction methods using old materials, finishes etc. The reasons for transformation may vary from place to place and from one case to the other more as a response to the changing requirements of people of the place. The purpose of this paper is to describe the scenario and causes of transformation of vernacular houses of different regions of India.

Keywords — Vernacular, architecture, transformation, manduva and level of acceptance.

I. INTRODUCTION

Vernacular architecture is based on local needs and construction materials, and reflecting local building traditions. In India, it denotes low cost, traditional village and small town settlements where construction is carried out without the help of architects. Climate is a predominant factor in governing the character of vernacular architecture in India. It is the informal functional architecture of structures, often found in rural areas of India, built of local materials and designed to meet the needs of local people (Yash S. Khandekar, 2017). Vernacular architecture is the visual language of a given region and the built-forms therein. It is also the culmination of relation between social, economical, climatic, cultural and technological aspects that existing the given region. Globalisation had influenced human life since the beginning of 21st century. With our continuous effort to achieve more comfort and convenience into our physical routine, there is a transformation found in a given time and place.

Vernacular architecture is transforming or evolve in over time and space, through trial and error. The traditions of a particular people and place are dynamics as they transform or evolve in time and space, resulting from the ever-changing circumstances, where the built forms also adapt to and reflect the newer needs.

Deniz Erg NselÖnder 2010 states that Home reflects a person's view, and his or her place and status in the society and collectively contains a different meaning than shelter. According to Bachelard (1964), home is defined as the center of our personal space, while according to Porteous (1976) home is the core of our territoriality. Arias (1993) asserts that meaning of home is variable, depending on the perception of the user. Smith 1994 talks about the necessity of continuation, self-expression, personal or family' identity and social relations for a shelter to become home.

II. TRANSFORMATION OF VERNACULAR ARCHITECTURE

Transformation is a natural phenomenon, which is a need based response of the users arising out of various factors. Hence, the reasons for transformation in vernacular houses vary from place to place and from one case to the other, more as a need based response to the needs people from time to time. For instance, the system of joint family is replaced by nuclear family, owing to out migration of present generation for better employment opportunities. Resultantly, as the family gets smaller, family hierarchy becomes less dependent on rituals and symbolic objectification. Growing need to use indoor space in the night time (entertainment, Television etc.) lead to changes in the plan form and spatial function thereof. The transformation may be partial in cases where repair has to be undertaken for an existing old house; but when a part of the same structure has to be newly built in-situ or annexe it to the old house, there may be complete transformation from the existing vernacular house. The said transformation may be observed in terms of Plan, Walls, Openings, Roofing, Flooring, Columns / Beams (Structural supports), Mouldings, exterior open spaces like courtyard,

Outside seating, Manduvaor other visual features. In addition, the transformation in the aforementioned components may be in terms of the material used, ornamentation, colour, finish etc. The transformed houses may bear resemblance to the vernacular houses despite the use of new materials and construction techniques or it may be a totally different typology.

In this context, transformation of vernacular houses has been studied in Himachal Pradesh (Kinnaur) and Andhra Pradesh (Ghantasala) through literature survey and primary survey respectively. A brief introduction and the scenario of transformation of each of the said locations is presented chronologically. Geography, geology, culture, climate and people's beliefs are understandably integral part of vernacular architecture and hence, focus of this paper is on physical aspects of the built form and the transformations therein.

III. CASE 1 - HIMACHAL PRADESH (H.P): THE CASE OF KINNAUR)

Kinnaur is one of the twelve districts of Himachal Pradesh. It is located at a distance of 235 km from Shimla and is in the northeast corner of the state, one of the hill regions of India.

A. Climate

Typically, Kinnaurhas severely dry winter followed by warm summer. Due to the said climate, southern slopes are preferred for building construction. Orientation of the dwellings is aimed to maximize the entry of sunlight into interiors of dwellings. Height of dwelling' floor is also influenced by the local climate. Small windows and lower ceiling heights are maintained to avoid heat loss and thereby keep interiors warm.

The villages in this district have vernacular landscapes intact – yet very traditional with many houses which bear typical character of Kinnaur with roofs made of slate stone and carvings of wood.



Figure 1. Location of Kinnaur in HP

B. Style of Vernacular house in Kinnaur

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A vernacular house in Kinnaurhas 7 attributes and like any other place, its typical spatial organisation:

a) Walls (Kath Kuni): Kath Kuni is Layered wall construction and is the structural method involving the use of local building materials assembled in a manner that it offers seismic resistance, as in Figure 2. There is a transformation in material used for walls, from use of stone to the use of concrete blocks.



Figure 2. Kath Kuni construction

b) Openings: The lowest storey of the house is used to accommodate livestock and to store the feed, the by-product of Agriculture which is the predominant occupation of people. Hence, doors and windows are less in number and size, as in Figure 3, 4, just to allow adequate light and air into the interior of the floor.



Figure 3. Small Windows of Ground floor



Figure 4. Small Doors of Ground floor

c) **Roof:** The ancient style of roof used to be the one which was made with the help of timber, mud, slate, and tree bark. However, over the years, the technique changed to a more climate efficient, sloped wooden plank roof which helped to avoid the deposit of heavy snow and rain (MaloufBelz, 2012).

d) **Roof-ridge ornamentation:** The roof-ridge of a vernacular house is an adorned feature and is one of the most decorated elements. The slate stone roof is mostly vertical which overlaps at its peak like a cap which restricts water from entering into the house, as in Figure 5.



Figure 5. Ridgeline adornment

e) **Overhanging of verandah:** Rooms in the ground floor are smaller in areathus providing enough space for rearing livestock. The projected verandah acts as an outdoor workspace beneath it, as in Figure 6.



Figure 6. Steep Pitched roof

f) **Carved wooden wall panel:** The ancient houses had intricate carving on the walls which make up the second storey. Flowers, Typically, labyrinths, peacocks, and other mythical creatures are used as decorative motifs (Malouf Belz, 2012).

3.2.7 Jallar: Carved fascia trim

This is a type of eave which moulds round the edges of the roofline with an interlocking floral motif. This is usually found in several sloped roof houses. Photo courtesy: Abstract of a Ph.D dissertation by Ms. Melissa Malouf Belz, titled, Spirit of place and the evolution of the vernacular house in Kinnaur, Himachal Pradesh, India, submitted to Kansas State University Manhattan, Kansas in the year 2012. The aforesaid aspects were subject to transformation owing to various circumstantial factors and the same are presented in Table 1.

TABLE I
SCENARIO OF TRANSFORMATION OF VERNACULAR HOUSES IN KINNAUR DISTRICT, H.P

S.No.	Transformation		
	Component	Effect	Cause
1.	Construction technique	Difference in material for Kath Kuni	<ul style="list-style-type: none"> ✓ Shortage of timber and stone ✓ Changing market with availability of new types of building materials ✓ Government policies and afforestation measures
2.	Spatial organization	Absence of projecting Verandah	<ul style="list-style-type: none"> ✓ Gradual shift from agriculture and other occupations and change in dwelling unit spatial configuration ✓ Change in climate over a period of time
3.	Materials	Wall:	<ul style="list-style-type: none"> ✓ Shortage of timber and

		Use of concrete blocks and bricks	<ul style="list-style-type: none"> stone ✓ Changing market with availability of new types of building materials ✓ Government policies and afforestation measures
		Windows: Glazing	<ul style="list-style-type: none"> ✓ Scarcity of timber ✓ Change in climate over a period of time ✓ Preference for bright interiors
		Roof: Use of corrugated sheets of tin	<ul style="list-style-type: none"> ✓ Economical and free of maintenance ✓ Changing market with availability of new types of building materials ✓ Light weight material leading to reduction of the dead load of the building
4	Decoration	Carving in Timber: Simpler design	<ul style="list-style-type: none"> ✓ Prolonged duration of construction ✓ Shortage of skilled work force ✓ Expensive and uneconomical
		Jallar: Use of metal Jallars	<ul style="list-style-type: none"> ✓ Shortage of timber ✓ Speedy installation ✓ Shortage of skilled work force ✓ Expensive and uneconomical
5.	Colour / Texture	Painting on outer façade	<ul style="list-style-type: none"> ✓ Symbol of status ✓ Protection of timber from external environment ✓ Improved aesthetic appeal

Two of the aforementioned transformations are shown in Figure 7 and 8.



Figure 7. Absence of Kath Kuni style with use of concrete blocks



Figure 8. Transformed Verandah with use of glass

IV. CASE 2 – ANDHRA PRADESH (A.P): A CASE STUDY OF GHANTASALA VILLAGE, KRISHNA DISTRICT

Ghantasala is a village in Krishna district, A.P, India. It is situated at a distance of 60 km from Vijayawada city and 11 km from Machilipatnam town. It was one of the flourishing places of Indo Roman trade in the yesteryears, besides being a centre of religious worship, along River Krishna and the Bay of Bengal.

A. Climate

It falls in the hot and humid climate region with relatively longer duration of the year bearing Summer season.

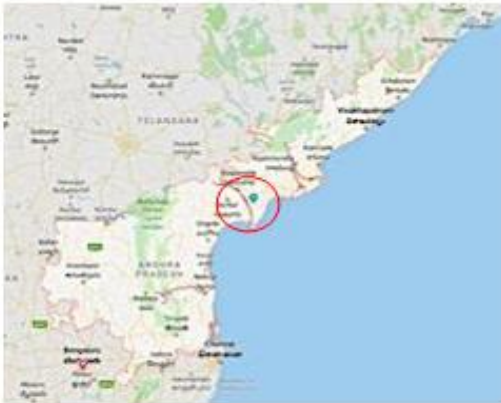


Figure 9: Location of Ghantasala village in A.P
Source:
<https://www.google.co.in/maps/place/Ghantasala>,
accessed on 14.09.2019

B. Vernacular house style of Ghantasala

There are nearly 3200 4houses in the village, as per the Census of India, 2011. Out of them there are nearly 50 houses which are the surviving ones among the vernacular style. Most of them are more than 60 ears old wherein third or fourth generation is using the house. Mud (locally called PaatiMannu / mud) is used in the form of hand baked bricks bearing 45-60 cm thickness; baked and unbaked mud bricks for wall, wood for openings and mouldings, Napa stone for floor, lime for mortar and plaster. A few key aspects which characterise the vernacular style of the village are as follows:

a) Mud for wall construction: Mud (locally called, PaatiMannu / mud) is used in the form of hand baked bricks bearing 45-60 cm thickness. The houses extend a good thermal comfort where the indoor temperature is less by 3-5 degrees Celsius than that the outdoor temperature



b) Lime for mortar and plaster: Raathisunnam as its locally called, is used for mortar as well as fine plaster for the walls. Mud (locally called Paati Mannu / mud). This is also considered as one of the factors to aid the indoor thermal comfort.



c) Pitched roof: The vernacular houses in Ghantasala village are predominantly pitch roofed with clay pan tiles and bamboo sections for the roof. The clear height of the ridge is 4-5 metres, depending upon the size of the main living area of the house and also as per the economic condition of the house owner of the then time.

d) Manduva: This is a puncture in the pitched roof through which rain water is collected into a pit dug on the floor of the living room. This small internal courtyard is in addition to the front, rear and side courtyards.



Figure 11. Manduva inside the house (left) and
Grannary in the front verandah (right)



Figure 12. Timber Pitched roof

convenience aspect lead to the location of Grannary near the front porch as seen in figure 12(right), space in the verandah for storing agricultural tools, kitchen detached from the main house or placed at the rear side of the house, toilets detached from the main house, front garden, kitchen garden etc

Photos courtesy: Author

The aforesaid aspects were subject to transformation owing to various circumstantial factors and the same are mentioned in Table 2.

e) **Spatial organization:** The functional spaces in the vernacular house are laid out as per the convenience of the user and a set of unwritten beliefs. The

Table 2:
Scenario of transformation in vernacular houses of Ghantasala village, A.P

S.No.	Transformation		
	Component	Effect	Cause
1.	Construction technique	Use of wire cut bricks, concrete blocks etc.	<ul style="list-style-type: none"> ✓ Availability of light weight and new materials ✓ Change in soil quality of the place
2.	Spatial organization	Absence of Grannary in the front porch or relocation of Grannary	<ul style="list-style-type: none"> ✓ Change of primary occupation from Agriculture to business or the like ✓ Influence of Vaastu, resulting in shifting to a different part of the plot in case its actually located in the north east portion
		Attached Kitchen, toilets	<ul style="list-style-type: none"> ✓ Change in the cooking equipment gadgets leading to smoke-free kitchen ✓ Change in comfort standards of the present users with Toilets ✓ Safety and ease of access at any time accessibility in case of attached toilets ✓ Ease of access for the elderly
3.	Building Materials	Wall: Use of concrete blocks and bricks	<ul style="list-style-type: none"> ✓ Scarcity of timber and expensive nature of vernacular materials ✓ Changing market with availability of new types of building materials ✓ Urge for contemporary aesthetic appeal ✓ Ease of erection of temporary or permanent structures for additional built up area, parking for vehicles etc.
		Windows: Glazing	
		Roof: Use of corrugated tin sheets	
4.	Ornamentation	Carvings in timber: Contemporary or modular type of carving	<ul style="list-style-type: none"> ✓ Longer time required to reproduce or emulate vernacular style carvings ✓ Shortage of skilled work force ✓ Expensive nature of vernacular style carvings
5.	Chrome / Texture	Use of Oil bound distemper and water-proof paints for exterior and interior	<ul style="list-style-type: none"> ✓ Symbol of status ✓ Better protection of building from inclement weathers ✓ Improved aesthetic appeal

Two of the aforementioned transformations are shown in Figures 13 and 14.



Figure 13. New materials and style used for the extended house beside the vernacular house



Figure 14. Manduwa transformed from open cut-out to piped concealed trough

V. CONCLUSIONS

As per the two cases studied above, economic constraints like income inconsistency, maintenance cost; geological / geographical constraints like non-availability of traditional materials like wood etc., social constraints like peer pressure, disinterest of present generation to continue the old tradition amidst their present routine, human resource constraints like non-availability of skilled labour, emotional constraints like compliance of local vaastu regulations, other family situations, Subdivision etc. are understood to be the causes of transformation in combination or in isolation, for the changing scenario of vernacular architecture of a place.

However, it was also understood through personal interaction with people in Ghantasala that they possess a sense of pride, can appreciate thermal Comfort, have attachment to vernacular buildings / components, aspire to satisfy the emotion requirement of living aged parents to retain the vernacular character and components of the building as much as possible. The process that shapes vernacular architecture is ever changing and thus vernacular architecture is an evolving form. In a nutshell, despite the constraints observed in the said two cases, people try and retain the visual form as far as possible even with the new materials in place of vernacular materials. This summarily discloses that though there are transformations in the vernacular houses on one hand, people have attachment to vernacular components and houses amidst changing architectural scenario from time to time.

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