

Transformations of Vernacular Architecture of India: Problems and Prospects

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Abstract

Vernacular architecture has always been subjected to change with time. It is often observed that the changes seen in the recent years are drastic and are not compatible with the existing built environments and surroundings. Many reasons lead to change in the physical forms of the built environments which also impact changes in the life styles and socio-cultural environments and vice versa. Changes in climate, socio-economic conditions, globalization and availability of materials have triggered transformations of vernacular architecture and these have influenced physical forms and spatial planning in terms of construction techniques, materials, and aesthetics. These transformations need to be recognized as expressions of emerging technologies, hybrid economies and social structures. They deal with evolutions of house forms, changes of materials and construction technologies and affect the living patterns, culture, and traditions places. This paper deals with transformations of vernacular architecture, and their influencing factors. It adopts a systematic documentary review with data collection on transformations in different climatic zones, to understand the stages of transformations and various reasons that have led to them.

Keywords: Vernacular Architecture, Transformation, materials, and construction technology.

Introduction

India has various vernacular building practices across a large and diverse geographical terrain. They are rapidly changing in terms of the built-environments due to globalization and urbanization, as well as the modern construction techniques and construction systems which are growing extravagantly (Thakkar, 2019). In view of these changes, prompted by the economic frames and social obligations of the inhabitants in vernacular regions, there is a need to understand the notion of vernacular and their transformations. The major factors that encourage transformations are the changes and advancements in technology, communication, industries, and political scenarios. All these aspects affect the economic and social development of individuals, which lead to changes in the built environment.

Vernacular architecture is a type of built environment, which communities construct in relation to their surroundings. As suggested by Savyasaachi (2019), vernacular builders may not necessarily be unskilled, illiterate, and technologically ignorant or live in isolation.

The phenomenon of the transformation of vernacular settlements is a recurring happening. Within the discourse of vernacular, the notions of change and continuity are constantly studied and questioned. Lately, it has been observed that transformations to occur to bring in inappropriate use of materials, which are locally available, although sometimes they lead

to the introduction of global building materials, and construction technologies. It is also note that the vernacular settlements also transform as they witness the changing social, cultural, economic, and political contexts (Pargunde & Desai, 2019). However, today's demand for understanding and observing vernacular is to adapt the changes to also ensure continuity. The processes and factors leading to these changes are of major concern and are good indicators for studies on Transformation.

Needless to say, here have been evident changes in the physical attributes of the built-spaces in the vernacular regions of India. They are influenced by the social, cultural, economic, and political changes. To manage these changes, it is necessary to understand the factors that lead to the changes as much as the actual changes that are taking place (Kotharkar & Deshpande, 2012; Vellinga & Asquith, 2006).

The transformations of vernacular architecture do not involve just one but various parameters such as the household production, practices, and livelihoods, which bring about a change in the community. The new culture and style of living demands new spaces to be accommodated. There could be changes in the patterns of living which would directly affect the patterns of vernacular layouts. Changes are also initiated by the emergence of newer technologies: such as electricity, telecommunication devices and home appliances (Chuapram, et. al, 2012). Although the indigenous techniques have always been adapting to the various changes and have sustained with the change in the surroundings and time, the rate of change in the current scenario is high and is likely to lead to the demise of vernacular.

The changes in transformation is best studied through residential buildings/houses, as it is the direct expression of changing values, perception, and ways of living (Rapoport, 1969). It is also important to study the surroundings to understand the changes and the impact on the sustainability of the built environment (Kotharkar & Deshpande, 2012). The degree of transformations vary in different regions. These changes are perceived with a consequence of nostalgia and lifestyle of what was regarded as indigenous vernacular houses (GhaffarianHoseini et al, 2014).

The evolution of vernacular houses throughout history has been a response to factors such as geography, climate, craftsmanship and materials. The use of local materials is one of the major principles that form vernacular houses. Many scholars generally consider that buildings using local materials are the only true vernacular buildings. However, in contrast, others argue that the import of industrialized sheet materials has both extended the life of many vernacular traditions and protected them at a relatively low cost. (Oliver, 1997; Punpairaj, 2013)

Thus traditional architecture is slowly changing, but architecture does not change alone. The built structures dominate the lifestyles and are governed by the occupants through changes in their social, economic and the physical environments. The identification of the gap created between the existing and the upcoming built form is crucial to manage the loss of history, information and ethnicity of a region and its people. Documenting and analyzing the transformations of the built s will allow the creation of policies and design standards to regulate these changes to retain the vernacular practices.

This study follows a systematic review of literature, in order to identify the problems and prospects in transformation of vernacular architecture. A research into the existing literature was carried out to establish the reasons, issues and methods to study the transformations of vernacular architecture.

Types of transformations

Vernacular architecture is primarily associated with the use of local materials, and traditional knowledge. It is not only about the surrounding environment but also about the social and cultural values that the people of the region hold. The spatial layout and planning reflect the cultural domain of a community where the daily activities and belief in the cultural order and system is reflected. The type of houses or construction depends on the availability of transportation (road connectivity), income of people, availability of construction materials, perception and traditions of individuals or communities.

The 20th century began to flourish economically due to urbanization and globalization, which has impacted upon the vernacular and traditional built environments. The process of change in vernacular generally was slow and natural, but the urbanisation and globalisation brought fast and abrupt changes in the built environments in many regions. These developments were due to rural urban migrations, improved transportation systems, information revolution, and a change in attributes and values due to international influence. These factors have led to vernacular becoming a rare and conservable entity, rather than being a part of a settlement (Dayaratne, 2008).

According to literature, transformations observed in the present are at three different stages; based on the transformation observed in various regions due to changes or introduction of new materials, construction technologies, policies, changes in the social structure, micro climatic conditions and economic status. Transformations have taken place in stages from partial to complete. The partial transformation or buildings in intermediate stage of transformation differ from having changes in material or the construction technique, or the change in spatial planning.

Transformations have different phases of development in the urban and rural areas. In the urban areas, the rate of change is faster as modernisation and infrastructural development are happening at a faster pace leading to diminishing of indigenous or vernacular architecture. In rural areas, the rate of transformation is still slow and hence vernacular architecture co-exists with the new constructions, along with few buildings which are at an intermediate stage.

The type or degree of transformations in vernacular architecture can be categorized in many ways. One of which is:

- i. Normative transformation or old vernacular structures
- ii. Partial/ Hybrid transformation or intermediate vernacular structures
- iii. Total transformation

- i. **Normative Transformations:** Vernacular practices differ in many ways and predominantly on the social and cultural values of a region. The size and type of variation in the built form observed in a region are visual representations of differences in the social or economic values within a settlement. In the changing scenario, the residents adapt these differences and form a parallel design or detail pattern. The adaptation of the exclusive elements in all the houses or built space is a 'normative' transformation (Weldekidan, 2015). Old houses or old structures is a term used often to define dwelling units or structures showcasing the vernacular nature. The dwellings with minimum to no changes have been categorised as 'old' or vernacular structures in the study of transformations (Kotharkar & Deshpande, 2012; Chuapram, et al., 2012; Dayaratne, 2008).
- ii. **Partial/ Hybrid Transformations:** The ease of access to different sources of material, and labour (skilled/ unskilled) has provided opportunity to the residents in a settlement to make changes suitable to their needs in the existing infrastructure. These changes may be physical or a development in spatial planning. When the changes are dominant but have most of the indigenous styles intact, it is known as partial or hybrid transformation. This type of transformation is widely accepted as in certain cases, these transformations are necessary to reduce the load on the operation and maintenance of the built structure (Weldekidan, 2015; Kotharkar & Deshpande, 2012). Transitions which are in process and are neither completely vernacular nor new, fall into the intermediate or partial/ hybrid transformations in vernacular architecture.
- iii. **Total Transformations:** The rapid changes in the built environments due to industrialization and urbanization have led to progressive changes in the built environment. The complete change in form, material, spatial planning, and construction techniques due to modern and international influences are considered as total transformations. These transformations are mostly built and inspired by the nearest developed city or urban area and are a product of skilled labour (Weldekidan, 2015; Malik & Ku Hassan, 2019; Kotharkar & Deshpande, 2012).

Reasons for the transformations

Vernacular architecture has a limited range of expressions, with a potential to fit different situations and cultural aspects in it. Vernacular has an open-ended nature, as it accepts changes and blends with them as they would with the surrounding environment. Vernacular takes additions to buildings, visually, functionally, and structurally. It has been an answer to many factors and priority of these factors differ in various regions. The factors mainly involve in an indigenous style of construction are climate, geography, culture, and socio-economic factors (Kasmaei, et al., 2017).

Change has been inevitable in architecture; new inventions have always been accepted and adapted by people, from addition of furniture to different utensils. The trends of family structure and standards of living have also brought a substantial change in the traditional forms. Introduction of new materials and technology have led to a decrease in the local craftsmen; in few regions, the art is slowly lost. Globalization and Industrialization have contributed to the growth of the economy, which has changed the standard of living through technological advancements and better communication facilities. It has also resulted in a loss of regional identity and uniqueness, and in many places, have also led to irrelevant designs and material implications (Kazimee, 2009).

The perception of vernacular architecture in many regions is pitted as backward, informal, poor and kuccha houses, where due to a lack of technological and economic growth, the houses have not developed. In this scenario, the contemporary is perceived as a modern, formal and rich way of living. Vernacular forms are still very popular in villages but in urban areas these informal settlements have been termed as slums. This thought process has led to the change of vernacular buildings to new styles of constructions. Various schemes and policies introduced by the governments restrict and do not permit the use of local/ vernacular materials such as mud, bamboo, timber, thatch, and grass as they need constant maintenance (ICOMOS, 1975). Moreover, the rapid urbanization in the past few years has also resulted in growth of urban areas, in terms of small and large cities (Pargunde & Desai, 2019).

There are many ways in which vernacular or traditional architecture have been influenced or transformed. Materials used in a building, the construction and technology adapted can be studied as the modifying factors. In India, the transformations of vernacular built environments have been influenced in a variety of ways by various factors. Some of these may be listed as:

- i. Change due to materials: Change in built forms due to the introduction of new materials, which were easily available at an affordable cost. The change of use of materials was also due to the depletion in availability of natural materials. With the loss of craftsmen or labour having an expertise in the available materials, the use of vernacular construction materials and techniques is declining. In some places, the switch in materials has come to reduce the cost and labour on maintenance; mud floors require constant maintenance and replenishment. Changes in materials began with small alterations, from a change in mortar, to brick type, and slowly to complete adaptation of global materials (Kotharkar & Deshpande, 2012; Savyasaachi, 2019; Jayasudha, et al., 2014).
- ii. Change due to climatic conditions: Climate is another influencing factor, which has affected the changes in vernacular built forms and planning. Due to the changing weather conditions from rainfall to increasing temperatures in different regions, the residences have changed to get accustomed to these changes. Introduction of mechanical ventilation, especially in the urban areas has also led to the use of modern materials and built forms not authentic to the surrounding built environments.
- iii. Change due to construction technology: Changing technology and revolution in machinery has led to advancement in construction technologies. This change has brought changes in the use of materials where it has become feasible for individuals to build easily with different materials. The local labour available have also lost the traditional building knowledge, needing to change in methods of constructions. (Kotharkar & Deshpande, 2012).

- iv. Change due to policies: Governments have launched schemes and housing developments that have been designed without the influence of the local surroundings or culture leading to a massive change in infrastructural growth. These developments have spread to the rural and tribal areas where it has in many places led to force in change of socio-culture influence (Savyasaachi, 2019).
- v. Change due to market: Industrialization and globalization have affected the social and cultural factors of a region, where people have migrated from various places. This has indirectly caused the loss of the indigenous practices with evident changes in built forms.
- vi. Change due to individual economic status: Economic status of the people of a region have adversely affected vernacular architecture. Due to affordability of better and comfortable living conditions, the dwellers have switched to modern construction and materials (Ryeong Ju & Syed Ariffin, 2015).
- vii. Change due to social structure: International (western) influence is a rage in India, along with growth in education and industrialization. Thus, opportunities of work/jobs have increased, although it mostly requires the people to leave their hometowns. The movement of people from one region to another is developing mixed cultures, which are beginning to develop their own social structures. In such environments, the evidence of change is more evident. These movements are predominant in urban areas but the effect of this is also evident in the villages which are being influenced by the nearby cities. (Jayasudha, et al., 2014; Malik & Ku Hassan, 2019; Ryeong et al, 2015)

Methods to study transformation of vernacular architecture

The changes in Vernacular have been documented and analyzed by researchers in India and abroad. The various studies enlisted in the table suggest that the case study method and the comparative method are widely accepted as research methods. The researchers have analyzed different parameters of a building or settlement with respect to the construction timeline. In cases where the timeline could not be established, the authors have selected the buildings reflecting the vernacular characteristics intact, partial changes, and complete changes in one or concentric civilizations.

Year	Climatic Zone	Aim	Parameters	Methodology	Outcome	Source
2005	Warm & Humid	The study focuses on the relationship between socio-cultural factors and the built environment at regional, local, and dwelling levels, by means of systematic investigation of the history of the study areas in Gezira.	<ul style="list-style-type: none"> • Lifestyle • activities • Quality of life • Community Value • Built environment • Type of economic development 	Comparative method of study	The author concludes that transformations in rural area do not only deal with the physical and economic, but with social and cultural aspects.	(Taha, 2005)
2012	Composite	The study focuses on the Nagpur Region, India. The authors have evaluated three regions for the selection of samples: rural/ vernacular, town and urban area on the bases of place, time and technology.	<ul style="list-style-type: none"> • organization • kinship-structures • pattern of cooking • sacred-profane 	Comparative method of study	The research demonstrates continuity and change in the traditional built-form of a village, town, and city in a similar climatic region, due to the impact of the region, accessibility, and culture.	(Kotharkar and Deshpande, 2012)

2013	Warm & Humid	This study is based on the common social-spatial organization of matrilineal kinship, and on an assumption that architecture and settlements are based on the culture established by the dwellers of the region.	<ul style="list-style-type: none"> • Layout of settlement • Layout of dwelling units 	Comparative method of study	The research proves that the change in socio-culture has a major role in the development of dwelling units and settlements. The latter is also affected by the changes in material availability and climatic conditions.	(Widiastuti, 2013)
2013	Warm & Humid	The author discusses about the evolution in the use of materials in the construction of traditional Thai Houses, influenced by modernization. The study focuses on three types of houses located in the Ayutthaya province of central Thailand.	<ul style="list-style-type: none"> • functionality • durability • safety • economic • aesthetic • availability of materials • construction typology 	Longitudinal and Comparative method of study	The research suggests a distinctive difference in the selected typologies. Although these changes have led to developing a contemporary style, which responded to the technological and cultural advancement inculcated in the existing vernacular style.	(Punpairoj, 2013)
2015	Hot & Dry	The author aims to analyze the characteristics and transformations in original Konso houses, in view of the space, function and building materials.	<ul style="list-style-type: none"> • Space • Function • Building materials 	Case study method	The research finds the degree of transformation in 3 different stages, totally transformed, partial transformations and normative transformations. It also elaborates on the consequences of these transformations in terms of cultural, social, and economic needs.	(Weldekidan, 2015)

2019	Hot & Dry	The author has developed an inquiry onto the degree of transformation of house spaces from traditional to modern, subject to the factors influencing as globalisation, regulatory framework, and other cultural aspects.	<ul style="list-style-type: none"> • location of the site • plot size • building regulations • ratio of covered to open areas • spatial planning • quality of walls • staircase design • lighting & ventilation • doors and windows • facade design 	Comparative method of study		(Malik and Ku Hassan, 2019)
2013	Hot & Dry	The study aims to understand and evaluate the transformation of vernacular houses in Gurage in terms of its physical and spatial aspects.	<ul style="list-style-type: none"> • Settlement analysis • Compound analysis • House unit analysis 	Case study method	It terms of transformation catalyst from all other factors, population growth and economic growth have a significance influence.	(Seid, 2013)

Table 1 enlists the aim, objectives, methodology and conclusions drawn from various research on the transformation of vernacular architecture. Most of the studies are based on the buildings and their relationships with the environment and social aspects. The studies have explored the extent and reasons for these transformations.

Literature suggests that the comparative method is more suitable to study the transformations of the built environments. The comparative analysis could be based on existing literature of the area or from samples of the oldest to the most recent built spaces.

Challenges and issues of transformations

The transformations of built spaces have brought disconnections between the past and the present. Vernacular settlements, until recently considered remote, have begun to see a faster pace of transition as they have witnessed the changing social, cultural, economic and political contexts. The changes impact the built environment of a region, both negatively and positively. Changes although inevitable can be governed and nurtured sustainably.

- i. Loss of indigenous knowledge: Introduction to machinery, modern construction techniques and materials have initiated a loss in the traditional knowledge due to the loss in demand of the regional craftsmen, the youth or future generation is not inheriting the ancestral knowledge leading to the complete extinction of few techniques and rituals pertaining to the built environment.
- ii. Lack of cultural values: The transformations of built environments have a direct impact on the social and cultural values of the people. In some cultural sets, the houses depict the social status of the individual: a village head has additional elements or a differently categorized roof which helps to identify his house. The changes in the typology of traditional and vernacular features have dissolved these values. Houses have reflected people's perceptions and ways of life and vernacular forms and planning have been adjacent to this concept. In the current developments, the kind of structures developed

- lack integrity of an individual's cultural values and in many circumstances is adapted from urban and international influences.
- iii. Loss of social values: Social lifestyles of the people revolve around their built environments. When the changes in the settlements occur, they change the form and pattern of the community lifestyle. Every culture or society has its way of living which is getting standardized because of the changes in the built environment (Taha, 2005; Malik & Ku Hassan, 2019).
 - iv. Lack of research: The policies and schemes formulated do not incorporate traditional knowledge or identify the use of vernacular architecture. The proposals are a mere promotion of ideas which are common to all with basic facilities.
 - v. There have been multiple negative impacts discussed about transformations, but popular research in this field aim to evaluate the sense of belonging with the changing cultural trends, and how the recent developments may give a push to additions or changes in the built environment.
 - vi. Developing a new identity: There are many forces which govern the changes and, in some cases, it may help to create a new identity for the region. Vernacular architecture has always undergone changes accommodating the absorption of the new additions and slowly blend it with it. Although the recent changes have been drastic, the challenge is to identify if it can be termed as the New Vernacular.
 - vii. Effect of Transformation on Sustainability: Vernacular architecture has developed with the surrounding environments and the social and cultural lifestyles of the inhabitants, and thus has always been assumed to provide sustainable built environments. The new materials and construction techniques adapted 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. The changes initiated with the change in economic conditions are creating a negative impact on the sustainability of the vernacular settlements. (Mirkar& Sharma, 2019; Thakkar, 2019; Widiastuti, 2013; Chuapram, et al., 2012)

Conclusions

Transformations in Vernacular architecture have been an area of concern as they lead to a loss in the indigenous knowledge, culture and social values. The concerns of restoring and safeguarding the vernacular settlements and region, raises the need to study these transformations. The various aspects of the built form that needs to be recorded and analyzed to study transformations are the use of materials, use of construction techniques, the socio-cultural influence, the economic status of the individuals within the community, and the impact of climate change. These changes in the built environment need regulations to manage orderly transformations.

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