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Overview of Vernacular Architecture

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Abstract - This paper intends to approach the evolution of the 'vernacular architecture' designation, and to reflect about its current conceptual application, considering its most substantial ideological divergences over time. Vernacular architecture is a building style that is designed dependent on local needs, availability of construction materials and reflecting on the local traditions. At any rate initially, vernacular architecture didn't consist of officially educated architects, yet depended on the design skills, abilities and convention of local builders this architecture is closely related to its context and is aware of the specific geographic features and cultural aspects of its surroundings, being strongly influenced by them. Thus vernacular architecture is related to the climatic issues, cultural and socio-economic conditions of different regions of any country.

Keywords : Vernacular Architecture, tradition, climate responsiveness, Indian vernacular architecture, sustainability, influences of

vernacular architecture, features and characteristics of vernacular architecture.

Introduction

The term *vernacular* means "domestic, native, indigenous"; from *verna*, meaning "native slave" or "home-born slave". The word probably derives from an older Etruscan word. The term is borrowed from linguistics, where vernacular refers to language use particular to a time, place or group.

Vernacular architecture is characterized by its reliance on needs, construction materials and traditions specific to its particular locality. It is a type of architecture which is indigenous to a specific time and place and not replicated from elsewhere. Historically, vernacular architecture has incorporated the skills and expertise of local builders as opposed to formally-trained architects. Thus Vernacular architecture depicts the environmental, cultural and historical features of a particular region as well as time period.



There are different forms of vernacular buildings found throughout the world. For Example Yurt, Ranch House, Chalet, Bungalow, Thatched Cottage, Hanok, Igloo, Izza, Stilt House, and many more. Even in India we would see different form of vernacular architecture depicting its cultural and regional importance for example cave temples of the Buddhist era, Hindu temples of Khajuraho, Mughal Forts and Palaces, Havelis in Rajasthan, Floating houseboats of Kashmir, Bamboo construction in Bengal and Assam, Chettinad houses from Tamil Nadu etc. So it is prominent that each form of building shows its cultural importance, region where it belongs, local resources, traditions and climate responsiveness of building.

Influences on Vernacular Architecture

It is influenced by human behavior and the environment. Architects have been sourcing climate responsive methods which can be applied to modern construction. It is a result of four basic factors namely:

- Site
- Climate
- Material
- Skill

One of the most significant influences on vernacular architecture is the macroclimate of the area. The design of vernacular architecture evolves over time in sync with the context where the building exists and including various other factors like:

- Availability of resources
- Skilled workforce
- Climatic and geological
- Historical influence
- Local culture
- Environment
- Natural and local skills
- Local technology
- Local materials

In vernacular architecture, users design and build at the same place. So, vernacular houses are more cost-effective as compared to contemporary-style houses. An affordable home design methodology is used to minimize cost and environmental impacts.

Frank Lloyd Wright describes vernacular architecture as "Folk building growing in response to actual needs, fitted into an environment by people who knew no better than to fit them with native feeling."

Characteristics of Vernacular Architecture

Some of the common characteristics of vernacular architecture are as below:

- **Orientation:** Different orientation of building makes it favorable for heating and cooling of building in different time of day and different weather conditions.
- **Shading:** The external walls and its openings of buildings are exposed to direct sun and water. In vernacular architecture, the

overhanging projections are used to provide protection to building.

- **Ventilation:** The relative humidity of the building is regulated by cross-ventilation. This is primarily important for houses located in hot and humid climates. To ensure good ventilation in your homes, you can find central courtyard, verandahs with openings on both sides, massive windows etc.
- **Climate Responsive:** Vernacular architecture includes a traditional design which is climatically responsive and aesthetically pleasing. Traditional architecture is different but they are inter-related. Climate-responsive design structures are built to lower the environmental impact, thereby reducing energy consumption.

Typical Features of Vernacular Architecture

Some typical features of vernacular architecture are as follows:

- **Plinth:** Plinth is the lowest part of the vernacular houses.
- **Walls:** The walls used are mostly load-bearing structures. They can be of stones, adobe stones, etc
- **Openings:** Openings are provided to maintain the thermal balance in vernacular houses.
- **Roofs:** They do not end touching the wall, but project outwards creating a large overhanging in order to protect the wall from sunlight and rain. They are usually sloping in form and their pitch varies according to the wind speed of that area.
- **Loft:** It is the overhead storage in the built structure. This loft space separates the upper hot zone from the lower cool zone of the building.



Elements of Vernacular Architecture

Some common elements of vernacular architecture are as follows :

- **Water:** Water is the most important resource which has to be utilized cautiously. There are strategies like water harvesting and recycling which have to be adopted.
- **Structural Longevity:** The materials used in the building decide the life cycle of the building. The materials which use more energy and resources should be used as per its recycling potential. Waste materials which are abundantly available locally can be used as per its life and durability.
- **Light and Ventilation:** The climate responsive buildings reduce consumption of artificial lighting and air conditioning systems. Houses in vernacular architecture are built in such a way that maximum natural light and air can be used.
- **Technology:** The technologies through features like jails, fountains, water to cool building fabrics, etc. add sustainable features at a macro level.



Construction Materials

As vernacular architecture is all about using locally available materials for construction, the materials used in this architecture vary from place-to-place. But generally, the construction elements include adobe, rammed earth, mud bricks, thatch, cob, bamboo, stone, clay, timber, compressed brick blocks, clay-fly ash burnt bricks etc. It is sheltered in response to climate; culturally connects with the surroundings; and uses materials that are available locally. Various vernacular practices have evolved over the years with locally available materials and new techniques to fulfil the needs of the people. Climate is the factor responsible for influencing the architectural forms and

keeping the inhabitants comfortable. In a climate-response aspect, the building designs have incorporated various elements like the interior courtyard – in order to escape the summer heat. These types of buildings are less load bearing. It is cheap as compared to conventional buildings. Some of commonly used materials are discussed below :

- **Timber** – It is one of the most frequently available and natural building materials. It is non-toxic, does not leak chemical vapor into the building and is safe to handle and touch. It is quite easy to work with, renewable, a very good insulator and readily available local material.
- **Adobe** – It is made from clay, sand, water, and a kind of organic material (sticks, straw or manure), usually shaped into bricks using moulds and dried in the sun.
- **Stone**- Stone is one of the major building materials that are part of Indian architecture. It is a versatile material and it can be used from the foundation to the parapet in a building. It can be used for providing strength to building and also as decorative purpose for building.
- **Clay**- Clay is used for buildings sustainable, traditional buildings. These buildings are of 2 types: one when the walls are made directly with the mud mixture and the other being walls built by stacking air-dried building blocks called mud bricks.

Planning Concept of Vernacular Architecture in India

The countryside in India is characterized by a dispersed pattern of single, detached houses traditionally self-built on family-owned land, a pattern that is commonly referred to as ‘one-off housing’. This pattern has been a longstanding feature of rural India or many parts of urban areas, and for many commentators it represents the traditional form of India rural settlement. An obvious way to further explore the relationship between architecture and rurality (or locality) is through architecture described as ‘vernacular’. A vernacular ‘approach’, as discussed previously, is heavily promoted in development plans and design guidelines, which emphasize its local, simplistic and, sometimes, ‘free-of-architect’ attributes.

- **Rammed earth** – This type of building construction which utilizes natural raw materials such as earth, chalk, lime or gravel. Rammed-earth walls are simple to construct. They are non-combustible, thermally massive, durable and very strong.
- **Fly-Ash-Sand-lime-Gypsum Bricks** – It used for residential housing walls and all other types of building construction as well as boundary walls. They are environment friendly, excellent strength, dry quickly, and have reduced water absorption and shrinkage.
- **Compressed Earth Blocks** – It is energy efficient, eco-friendly with excellent surface finish. It is a cost effective material with good thermal insulation.
- **Clay Fly-Ash Burnt Bricks** – It is environment friendly, energy efficient and locally manufactured material.
- **Micro Concrete Roofing Tiles** - MCR tiles are a cost-effective and extremely versatile roofing material. MCR tiles can be used to make attractive roofs on villa houses, farm houses, pavilions and gazebos and also used in highway constructions. In regions with heavy rainfall, these tiles are used as cladding material as it offers both waterproofing and aesthetic appeal. It has been used extensively in cost effective housing schemes, poultry farms, restaurants and workplaces.

Indian vernacular planning consists of planning and designing structure with formal, informal and functional designs.

In most of rural India structures are built using local materials and designed and planned in such a way to meet local requirement of local residents. The structures are not only built with local materials but also designed in such a way depicting the necessities and culture of native locality. The builders and planners of these structures are untrained in formal architecture, which is also reflected in their work. Their work also shows us rich diversity in India's climate, the local building materials, and the variations in the social customs and culture and art of native area.

The rich vernacular tradition of India starts from the natural settings of the site, and responds to metaphysical concerns, climate, local skills, construction materials and appropriate technology.

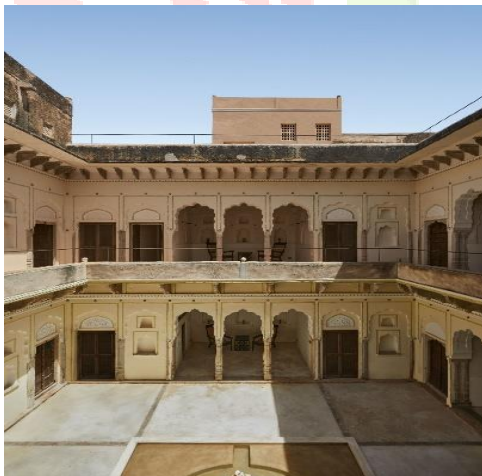
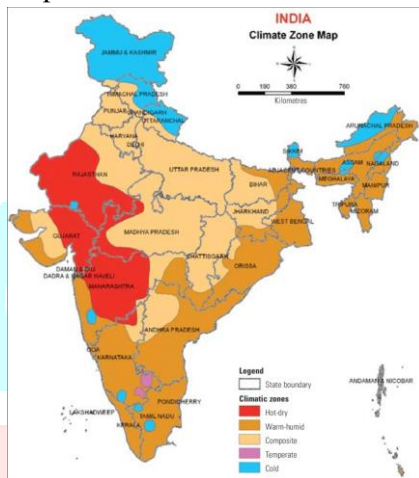
The essence of vernacular architecture also lies in cultural traits and attributes.

Indian Climate

India is a country with diversified climatic and socio-cultural conditions. Each region has its own identity with climate responsive building design in the form of vernacular architecture. The figure below shows different zones in different parts of India.

The country has been divided into five major climatic zones:

1. Hot and dry,
2. Warm and humid,
3. Temperate,
4. Cold and
5. Composite.



Havelis in Rajasthan



Wadas in Maharashtra

Hot and Dry Climate

This zone lies in north western and central region of India namely Jodhpur, Jaisalmer, Thar desert, some part of Gujarat and Maharashtra. This region is flat, sandy, and rocky and sparsely vegetated with cacti thorny bushes. Humidity is low in the region thus the climate is dry. During summers, winds blowing are very hot and sand storms are also common. The architecture has an artistic expression of the climate and the culture of the region. Most of buildings will be two to three storied buildings. Due to hot weather in most time of day adjacent building, road pavement heat up quickly which glares building in day as well as night time of day. One way to avoid this is by placing wall protecting external spaces to keep dust and wind away. Other way is by landscaping trees around exterior of building which helps in keeping cool and acting as dust and sound barrier. In this area central courtyard is also seen which provides cross ventilation and natural cooling. Most of opening are to the internal courtyard rather than exterior surface. Shading is most important building design strategy for comfort in such weather. Shading of building surface is done by architectural projections like chajjas, jharokas, etc. Havelies in Rajasthan and Wadas in Maharashtra are example of such architecture.

Warm and Humid Climate

The warm and humid region covers the coastal region of India. Cities like Mumbai, Chennai, and Kolkata all lay in this region. There are long monsoon period with heavy rains in the area. The humidity is very high in this region which encourages abundant

vegetation. The main criterion of designing in this region is to reduce heat gain and provide shading. Generally houses are isolated from others and self-sufficient with its own source of water, temple, bathing place and agricultural land. The houses are single floored and high on plinth with verandah on one

or two sides. Houses have sloping roof to protect from heavy rainfall. The house is blend into landscape of tree and vegetation. Houses have central courtyard with verandah on both sides for cross ventilation. Local materials are used such as laterite, granite, timber, mud, thatch, coconut leaves, bamboo and Mangalore tiles.



Typical House in Kerala

Composite Climate

This zone lies in entire central part of India. Allahabad, Kanpur, New Delhi, Nagpur and parts of Madhya Pradesh are some of the areas that experience this type of climate. The climate in this region is very hot in summers and very in winters. Most of the houses are single storied constructions with tiled roofs with gentle slope and have low plinths. The requirement of high

thermal mass to provide capacitive insulation was well understood by the local builders, therefore, the walls and roofs are very thick, mostly in stone, brick or in mud and slates or tiles

respectively. The sunshades are either very small or are completely avoided sometimes. On the other hand, a small tin sheet awing is fixed to the wall to cover the window, or alternately, the slate lintel extended a little beyond the wall forming a sunshade.

Moderate Climate

The moderate climate zone experiences mild to warm summer and cool winters. The need for home heating in winters is greater than summer cooling. Few opening on external side other than doors are a must. Most of the time cooking and sleeping in rural India is done outdoors during the summers. The mountains of Great Diving range keep the winters cold and summers pleasantly warm.

Cold climate

This zone lies in northern part and some part of north east India where mountain range is found. Cities like Kashmir, Sikkim, Shimla and upper part of Assam hill station from south India all experience cold and cloudy climate. The climate in this area is pleasant in the summers with heavy rainfall and moderate to

heavy snow fall during winters. Ladakh experiences cold and sunny type of climate. This region have very little vegetation and is considered as a cold desert. The structures are designed using local materials like stone, mud and clay. The houses are very close to each other. This kind of climate requires buildings to be heated throughout the year. Thin mud and bamboo are used for walls on the upper floor and brick or bamboo for upper floors. Roof is made using stone slabs or country tiles. The roofs hang from all sides, providing protection of core spaces from all sides. A typical houses are either square or rectangular in shape. The houses are about two or three storeys high. Each story consists of huge single room without any partitions. Buildings are faced on the south or south-west to receive maximum sunlight. The houses are aligned parallel to the slope of the mountain and never perpendicular to it. The buildings are made from locally available stone and timber packed with clay and cow dung as mortar. The roof is finished with locally available slate.



Typical House in Ladakh

Conclusion

With the time changing and world evolving day by day, it is important to keep changing with modern tides of time. However, it does not mean forgetting our past and traditions. Traditional Architecture using the indigenous, vernacular materials and construction techniques helps in keeping our traditions alive and contributes in environment and economy. Vernacular architecture is also sustainable architecture as it uses locally available material and also natural materials are used which keeps environmental balance and can be recycled easily. It is economical as local materials are used thus transportation cost is also reduced. It also depicts the rich vibrant culture of native locality. Indian vernacular architecture is the world's one of the most beautiful styles of architecture. It is important to adopt the vernacular style of architecture for future as it will

not only glorify India's rich culture and traditions but also contribute to the environment around us.

An elaborative study of the typical buildings of the major climatic zones depicts some common features:

- The buildings should be designed in response to the sun paths, wind directions and allows for adequate cooling by means of shading devices.
- The site planning should ensure that the orientation and direction of the building should be in such a way that it prevents the harsh sun lights and yet allows broad daylight and provides adequate cross ventilation in warm climate zone.
- The design of the houses should follow by the way of life, religious beliefs, culture and customs of inhabitants and minimum use of space.
- Locally available materials should be used along with the modern materials. The use of locally available craftsmanship is encouraged for creating cost-effective sustainable buildings.

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