

## Vernacular architecture in India

Yash S. Khandekar<sup>1</sup>, Ojas P. Rahate<sup>2</sup>, Ashish B. Gawande<sup>3</sup>, Kartik A. Sirsilla<sup>4</sup>, Sakshi M. Govindani<sup>5</sup>

<sup>1,4</sup>Dept. of Environmental engineering, KIT's College of Engineering, Kolhapur, Maharashtra, India

<sup>2</sup>Dept. of Mechanical engineering, KIT's College of Engineering, Kolhapur, Maharashtra, India

<sup>3</sup>Dept. of Civil engineering, KIT's College of Engineering, Kolhapur, Maharashtra, India

<sup>5</sup>Bapuraoji Deshmukh College of Architecture Sewagram, Wardha, Maharashtra, India

\*\*\*\*\*

**Abstract** - The ever increasing awareness of potential of a building to effectively impact and affect environmental issues cruises the practical applicability of vernacular architecture to the forefront. To understand how sustainable constraints are imposed on buildings, vernacular architecture chalks out basic and simple solutions and features. These methods respond to sustainability quite effectively by adoption of low energy techniques, construction features, and orientation and material resources without compromise of human comfort. With the evidence that vernacular architecture has the features of an excellent sustainable model, this study aims to examine and observe its applicability in rural settlements of low profile areas such as Karjat and Bhopal. A typical 'art village' is designed, developed and studied to house a community. Such establishments pave way for vernacular architecture along with maintenance of integrity as well as heritage in the community.

**Key Words:** Vernacular, Architecture, Sustainable model, rural settlements, Integrity, Heritage

### 1. INTRODUCTION

Vernacular architecture is a category of architecture based on local needs and construction materials, and reflecting local traditions. The 'vernacular', in India, denotes low cost, traditional village and small town settlements, where construction is carried out without the help of architects and professionals, where building activity is regulated by a long tradition that stretches back for many centuries, in many cases. Climate, of course, is a predominant factor in determining the forms of vernacular architecture in India. Vernacular settlements in India

often take on the shape and form that is dictated by the climate they are in, or the socio-cultural norms that they are designed to preserve and protect. It is the informal functional architecture of structures, often in rural areas of India, built of local materials and designed to meet the needs of local people.

#### 1.1 Factors affecting vernacular architecture

- Climate of the region
- Geography of the region
- Availability of material

#### 1.2. Climatic regions of India-

1. Hot and dry
2. Warm and humid
3. Cold and cloudy
4. Cold and sunny
5. composite

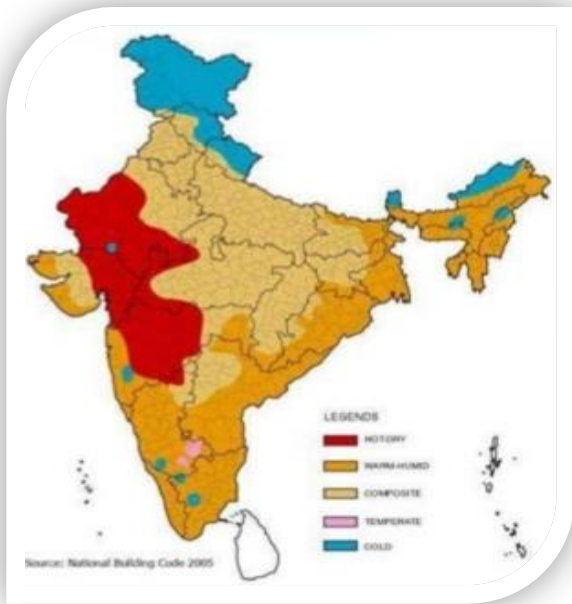


Fig -1: Climate zone map of India

## 2. CASE STUDY

### 2.1 Vernacular architecture in Assam-

Type of the house is Assam type house. In Assam British started their kingdom in 1826. During 120 yrs of their role in Assam they had constructed many buildings, bridges, bungalow, school and colleges etc. Before the British the building constructed by kings was very uneconomical and the construction system was very difficult. It was not possible for common people. The house of the common people was of thatch roof with bamboo walls plastered with a mixture of mud and cow dung. The British studied the local environment and local building materials and accordingly designed comfortable and beautiful buildings. They had started a special type of construction, which finally become the typical building type and called" Assam type house".

### 2.2 Topography of Assam

- LATITUDE - 26.25 dg.N
- LONGITUDE - 91.8dg.E

Topographically, the state can be divided into three parts, viz.

1. Brahmaputra valley, the Barak valley and the Karbi Anglong range.
2. Assam falls in a zone prone to earth quake.
3. Though mild shaking are familiar to the region, high-intensity earthquakes are rather infrequent.

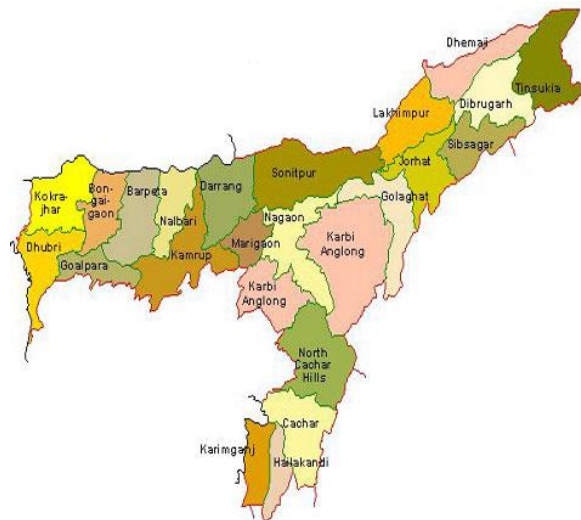


Fig -2: Map of Assam

### 2.3 Climate of Assam

In Assam, pleasant sub-alpine climate prevails in the hills. However, the plains experience tropical climate during the rainy seasons. Winter starts from around the end of the month of October and lasts till the mid of March. The temperature drops to a minimum of 6 to 8°Celsius, the nights and early mornings are foggy. Summer arrives in the middle of May accompanied by high humidity and rainfall. The temperature

reaches a maximum of 35 to 38 o Celsius. However the frequent rains push the mercury level down.

### 2.4 Building type and building materials

The building is of two storied house. Building is symmetrical on both sides. 1st floor is connected with a timber stair case. Open spaces in front (chotal) and back side (Bari) of the house. Walls are of timber frame work, inside those panels ikara used to fill. These ikaras are cut in size of the panel and laid vertically. The horizontal members usually used are bamboo. After putting the ikara it is left to dry for few days. Then it is plastered on both sides with mud mortar. 3 layers of plaster are done alternatively after drying of each coat. Finished coat is of liquid mix of mud and cow dung . The plinth is made of one brick thick wall.

Roof layout is very critical. It is in various level and multi-cornered. But the angle of inclination is same. Roof is of corrugated iron sheet. Sheets are fixed in timber purling by nail. Rubber washer is used to protect the rain drop penetration through the side of the nail.

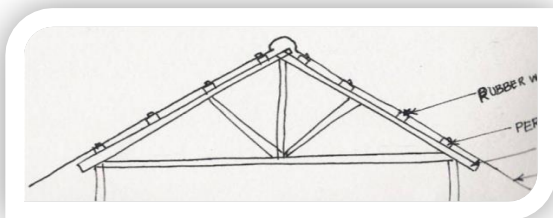


Fig -3: Layout of Roof



Fig -4: Typical Building Pattern

### 3. BUILDING PLAN

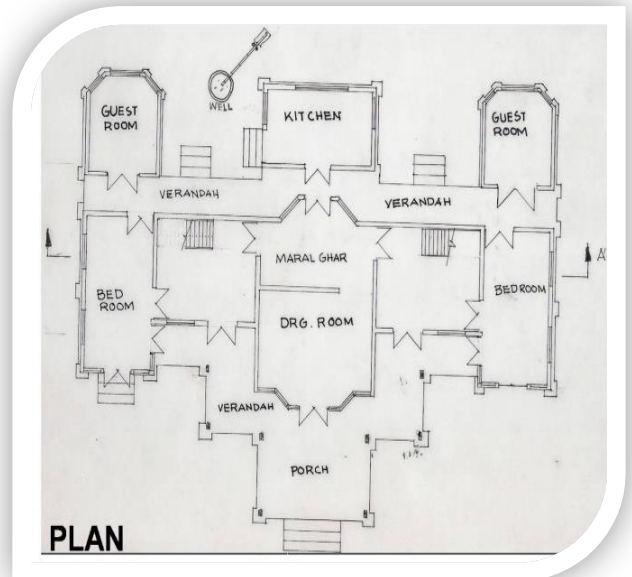


Fig -5: Building Plan

#### 3.1 Special features

##### 3.1.1 Front façade

As the site is compact with so many houses, so as to provide better ventilation, front façade is very important. Contains large number of openings. Sheds are provided, restrict rain fall. Arrange in different level. Better ventilation in front rooms. Sill level of

the window is about 60 cm only Roof is of sloping from to provide shed during rain.

### 3.1.2 High plinth level and entrance

Plinth is of about 60-70 cm. to provide foundation to reduce dust and smoke of roads to enter inside the house, to provide better air circulation for light inside. There are two entrances in the house. The entrance is directly open to the street. It is ideally built according to the needs of the occupants. 10 meters of open space is provided in front of the house.



Fig -6: Entrance of house

### 3.1.3 Ceiling and flooring

Ceiling is made of wooden beams. Wooden members are placed very close to each other. It is supported by vertical wooden/steel columns. A fully wooden structure is used for ceiling. Flooring is made of cement.



Fig -7: Ceiling and floor

### REFERENCES

1. Rudofsky, B., 1964. Architecture Without Architects. New York: Museum of Modern Art
2. Shukl, D., 2009. Madhya Pradesh ma Aadijano ki Sanskriti Ek Jhalak. Bhopal (Madhya Pradesh): Jansampark Madhya Pradesh ka Prakashan.
3. Bashiri Mahsa (1391), "Cheap House from Dream to Reality", *Culture and Architecture Magazine*, No. 48, The 14th Year.
4. Avidesh Talayi & Darya Nosrat Pour (1390), "Nanotechnology, A Bridge to Sustainable Architectu Local Conference of Architecture and Constructing Materials".
5. Ferrigni F., Helly B., Mauro A., Mendes Victor L., Pierotti P., Rideaud A., Teves Costa P.:

*Ancient Buildings and Earthquakes. The Local Seismic Culture approach: principles, methods, potentialities*, Centro universitario europeo per i beni culturali, Edipuglia srl, Ravello 2005.

6. Johnson H.: *The Changing of the building traditions among the Forest Finns*, in: *CIAV Annual Meeting and Seminar*, Finnskogen 2010.
7. Langenbach R.: *DON'T TEAR IT DOWN! Preserving the earthquake resistant vernacular architecture of Kashmir*, UNESCO, New Delhi 2009.