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RESEARCH ARTICLE

SIGNIFICANCE OF FORESTS IN TRIBAL VERNACULAR ARCHITECTURE: IN CONTEXT TO “KHARIA” TRIBE IN JHARKHAND, INDIA

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Abstract

Tribal community and their association with nature is deeply rooted. The primitive tribes in India and the world are settled around forests or islands and use their products for their livelihood. The style of architecture, art, culture, beliefs, socio-economic framework is guided by the local environment. As the primitive tribe remain secluded from the urban development and advancement, their beliefs and practices are limited and are based on real time experiences. The availability of resources around the community shapes the type of architectural and cultural practices of the tribe. The forest provides ample resources like wood, fodder, mud, straw, etc. which serves as construction materials, fuel, and source of livelihood for the ethnic community. The article throws light on the influence of forests and its resources on the vernacular architectural style, the settlement pattern, dwelling units, construction technology and, materials which ultimately responds to the local climate, art, culture, socio-economic framework, and beliefs of the people.

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Introduction:-

Nature has been channelizing human existence and its sustainability till time. Human beings are a part of the biosphere and their symbiotic relationship with the other physical components of nature such as land (lithosphere), air (atmosphere), and water (hydrosphere) are crucial for the continuation of their race on earth. Forest is a part of the land covered with trees with a tree canopy cover of more than 10%, which is not primarily under agricultural or other specific non-forest land use. Forests cover 31 percent of the world's land surface, store an estimated 296 megatons of carbon, and are home to most of the world's terrestrial biodiversity. Forests are a source of fibre, fuel, food, and fodder, and they provide livelihoods for millions of people, including many of the world's poorest. Forests help mitigate climate change and improve soil, air, and water quality. If managed, forests are also a source of renewable raw materials, making a crucial contribution to building circular economies (The Food and Agriculture Organization (FAO), United Nations). Tribal and other forest-dwelling communities have deep cultural, spiritual, and livelihood links with the forests around them. The socio-economic pattern among various ethnic communities in India varies with geographic location, type of community, age, gender, education, availability of resources, services, and infrastructure. Their art, culture, architecture, economy, and beliefs are all associated with forests. The study here is on the impact of forests on the tribal vernacular architecture regarding settlement pattern of the community, their dwelling unit plans, construction technology, and materials with aptness to respond to the local climate, socio-cultural beliefs, art, and culture to favour the functional need, taking the context the “Kharia” tribe of Jharkhand, a tribal state in India.

Tribal Vernacular Architecture

Vernacular architecture of a place is an outcome of the relationship between socio-economic factors, local climate, culture as well as construction techniques employed by people of that given place. (Venkata Krishna Kumar Sadhu & Ramesh Srikonda, 2020). Traditional and Vernacular homes form the basis of conscious design (Meir and Roaf, 2006). Vernacular architecture practices create a habitable and thermal comfortable space, along with a judicious use of forest resources. Tribal or ethnic communities in different parts of India and the world, for the longest time, have shaped and retained the art, architecture, and tradition of the place they live in. Different tribes have a profuse and colorful style of vernacular architecture but their evolved response to geography, climate, materials, and sustainable methods serves a point of commonality. India has a percentage of 8.2 population as its tribal population spread all over the country (Census 2011, Ministry of Home Affairs, Government of India). Their population is high in geographically remote areas, usually near forests and islands, where the urban population is scarce and natural resources are abundant. "Function is an analogy between social life and organic life" (Mandal, 2001). Hence, the surrounding environment impacts their architectural style. Specific factors focused on are:

Settlement Pattern

The settlement pattern of the tribal community is primarily of three types based on morphological studies. The first typology is a village predominant of farmers. The second type of settlement is comparatively smaller. Here, the number of dwellings goes up to 100. They are linear in pattern i.e., a row of houses facing each other along a street or pathway. The third typology is of the tribes inhabited in the hilly areas. They depend upon forest produce for their livelihood. The dwelling units of this typology are generally scattered around without a defined pathway. They lived in clusters of three to four houses and even these clusters are at different levels at certain distances because of undulating landforms (Dhote K.K, Onkar P and Das S, 2012).

Dwelling Unit Plans

Occupation of a tribal community influences the dwelling unit plan. An agriculture-based family has a better economic condition than a primitive tribe. The dwelling unit has a hierarchy of spaces. A fenced or walled area with a semi-open courtyard for cattle is there. Mud containers for storing grains are there. The courtyard leads to a private space with a raised platform for the family. The roof type is a lean-to for semi-open space and a double lean-to for covered and private spaces (Dhote K.K, Onkar P, and Das S, 2012). The unit appears to be more primitive with one rectangular block and a sloping roof in cases of community settlement around forests. All the household activities take place in that single space. There are no windows, and the source of ventilation remains the thatched roof above.

Construction Technology

The fundamental purpose of construction in vernacular architecture is to gain thermal comfort through passive means. Special mud lumps left with vegetable waste and crushed pebbles matter to mature for wall-construction. (Gautam, 2008). The high thermal mass due to mud walls helps to keep the house cool in the evenings in summer. The huts normally have minimal openings. Often, the only opening on the external walls is the main door. Some houses have windows, but they are small and placed high to ventilate the indoors. The small windows also help to keep the hot summer sun and cold winter winds out (Gupta, J. 2020)

Materials

"Vernacular architecture can be said to be the 'architectural language of the people with its ethnic, regional, and local 'dialects.'" – Paul Oliver (Author of The Encyclopedia of Vernacular Architecture of the World).

The huts were made of local materials. Timber, bamboo, clay, straw, cow dung, and a special variety of grass were used to build houses (Dhar, 1992). The walls were made of a special type of mud obtained by souring earth by adding vegetable waste and leaving it to mature. (Cooper & Dawson, 1998).

Context Case: Architectural Style of Kharia tribe in Jharkhand, A tribal state in India

The Scheduled Tribe (ST) population of Jharkhand State is as per the 2011 census 7,087,068 constituting 26.3 percent of the total population (26,945,829) of the State. The Scheduled Tribes are primarily rural as 91.7 per cent of them reside in villages. Jharkhand has 32 tribal groups:

Munda, Santhal, Oraon, Kharia, Gond, Kol, Kanwar, Savar, Asur, Baiga, Banjara, Bathudi, Bedia, Binjhia, Birhor, Birjiali, Chero, Chick, Baraik, Gorait, Ho, Karmali, Kharwar, Khond, Kisan, Kora, Korwa, Lohra, Mahli, Mal-Paharia, Parhaiya, Sauria-Paharia, Bhumij (Official Website, Government of Jharkhand).

About Kharia tribe

Kharia at Jharkhand belongs to the Proto-Australoid group. The Kharia in Jharkhand are said to be the descendants of Nagvanshi Raja and are divided into three major sections namely DudhKharia, DhelkiKharia, and Hill Kharia. The Kharia of Jharkhand is one of the most primitive tribes that chiefly depend on the resources obtained from the forests of the territory. The Hill Kharia largely depend on roots, edible herbs, leaves, fruits, seeds, flowers, honey, wax, etc; the DhelkiKharia and DudhKharia depend on agriculture. The Kharias are centered around the hills and plains adjoining the hills. The settlement of the Kharia is dispersed throughout the different districts of Jharkhand.

Socio-Economic Framework

The Kharia society is a patriarchal society where the inheritance law and the laws of succession largely support the male members of the society. A Kharia society falls under the jurisdiction of the Panchayat system and a Pradhan is supposed to be the head of the society. Therefore, it becomes the duty of the Pradhan to look after the peace and prosperity of the society. Furthermore, the economy of the Kharias is based on forest produce, agriculture or wage-earning. Besides, the Kharias also practice fishing, hunting, food gathering, etc. (Department of Forests, Environment & Climate Change, Govt. of Jharkhand).

Influence of forests on the vernacular architecture of Kharia tribe

The Pahari Kharia or Hill Kharia tribe is settled around the forests on the hilltop or on the slopes (Figure 1). The dwelling units are not aligned in any specific pattern but are scattered. Lack of any pattern is due to the undulation in landform. They are usually in a cluster of 10-20 families and manage their livelihood together in groups on forest products.

On the other hand, Dhekli Kharia and Dudh Kharia tribes are settled in plains and practice agriculture. They have a linear settlement with dwelling units on both sides of the pathway. Figure 2 depicts the hierarchy of settlement pattern of the Kharia tribe. The Hill Kharia villages which are in the forest are homogeneous; whereas those situated in the plains are heterogeneous in composition. Although they live with other communities in a village, they have a separate hamlet of their own (Tudu, F., 2017).

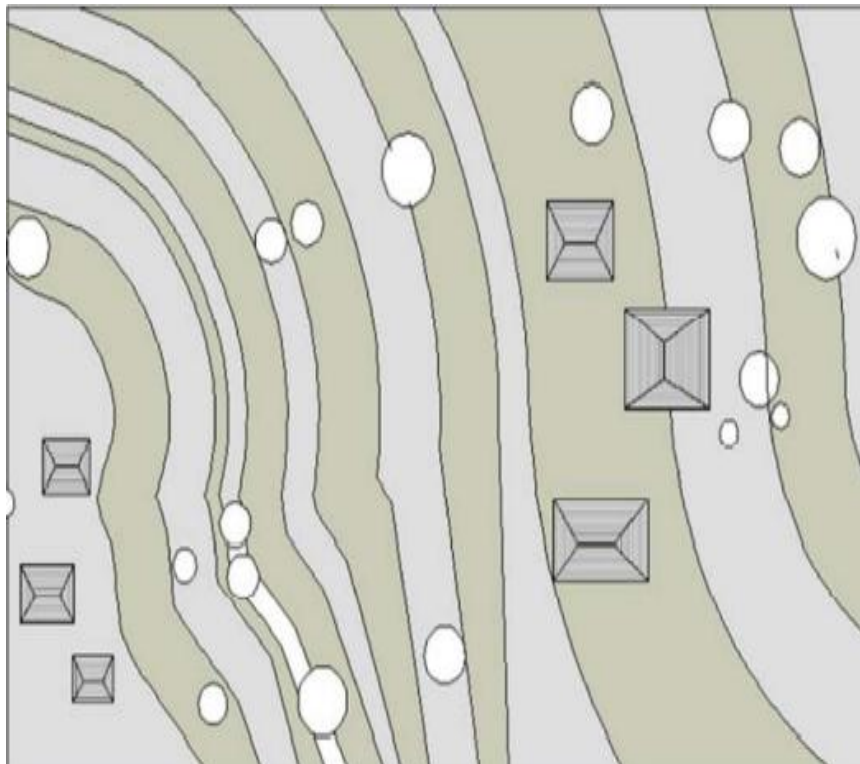


Figure 1:- Scattered settlement pattern of Hill Kharia Tribe on hill slopes near forests, (Source: Krishna Kumar Dhote, Identifying the Sustainable Practices from the Vernacular Architecture of Tribes of Central India, 2012).

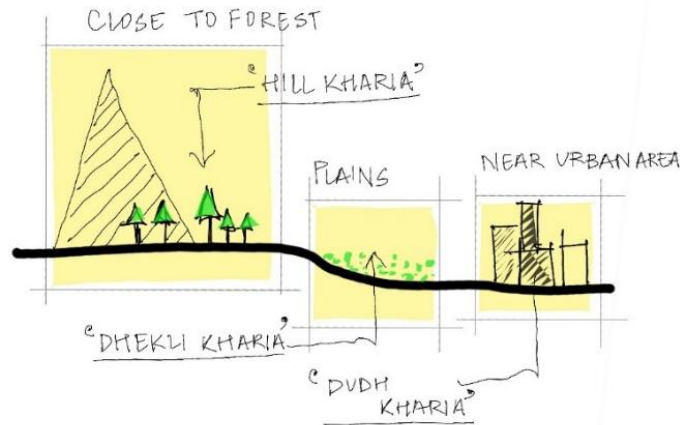


Figure 2:- Hierarchy of settlement pattern of Kharia tribe, Source: Author's own creation.

The houses of the Kharias are generally rectangular in plan. The houses possess a single room that serves the purpose of a bedroom, kitchen, and store. Platforms from mud is made for kitchen utensils (Figure 3). A cowshed or pig stay is adjacent to the dwelling unit (Figure 4). The walls don't have windows to avoid heat loss and protects from attack of wild animals. A single door is the means of access. The ventilation is through the porous roof, keeping the inside cool in summers. The extended raised plinth around the periphery of the unit is a multifunctional design that is used for many household tasks. Figure 5,6 shows a plan and section of a typical Hill Kharia dwelling unit respectively.

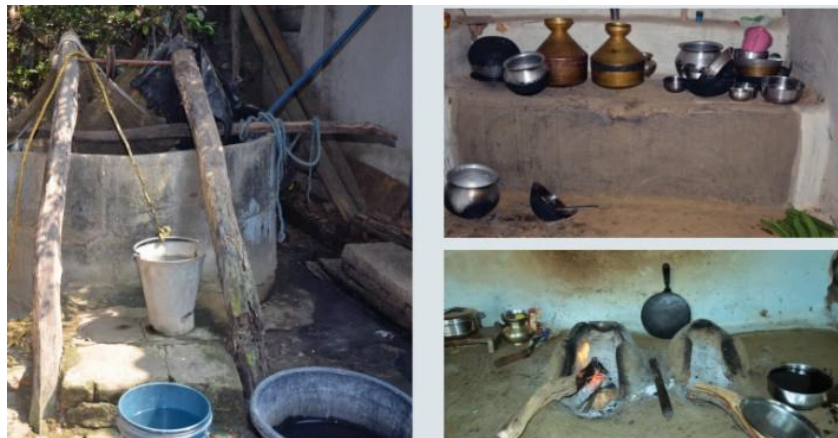


Figure 3: - Interior of a Kharia Tribe hut, (Source: Kharia, ST and SC research and training institute, 2016).



Figure 4: -A Kharia tribe hut, (Source: Kharia, ST and SC research and training institute, 2016).

Materials like timber (Sal wood), mud, straw, thatch, rope, and cow dung are used. Sal wood Timber is a renewable, sustainable, attractive, strong, durable, and cost-effective natural building material that combines beauty, superior performance, and environmental advantage (Binkley and Earhart, 2005). Its flexibility and versatility offer a multitude of structural applications such as beams, walls fencing etc. (Chandramolly, 2015). All the materials are readily available from the forest and around.

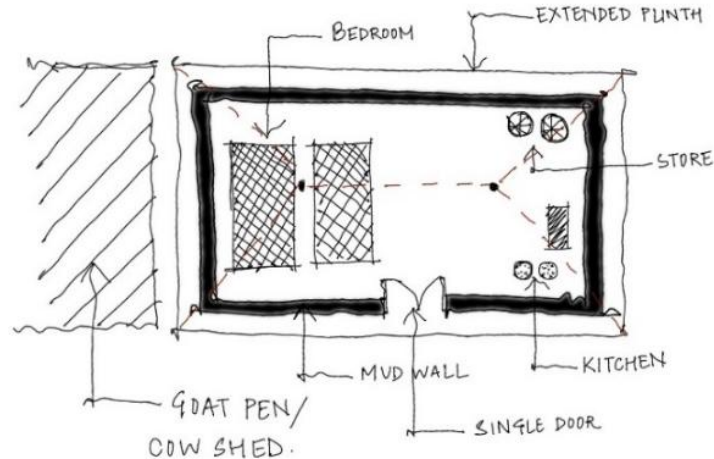


Figure 5:- Plan of a typical Hill Kharia dwelling unit, Source: Author's own creation.

The construction technology is very primitive and sustainable. Use of Sal wood as a framework for reinforcement in walls provides sturdiness and strength to the structure. Sal wood can be reused and is found in abundance in areas near the Kharia community tribe. Mud plaster is applied over the timber reinforcement. It is a mix of mud, straw, and wood chunks. A coat of cow dung slurry is applied on top of plasters for smooth finish and protection from termites. The roof of the hut is made of a double-sloped wooden joist and rafters and thatched with straw or clay tiles (Khapada) on top (Figure 7).

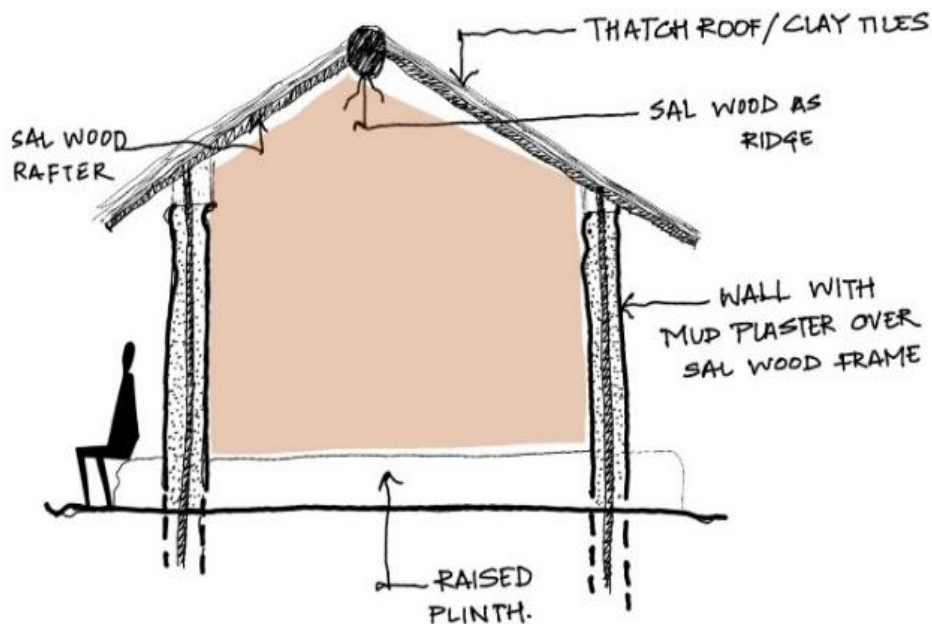


Figure 6:- Section of a typical Hill Kharia dwelling unit, Source: Author's own creation.

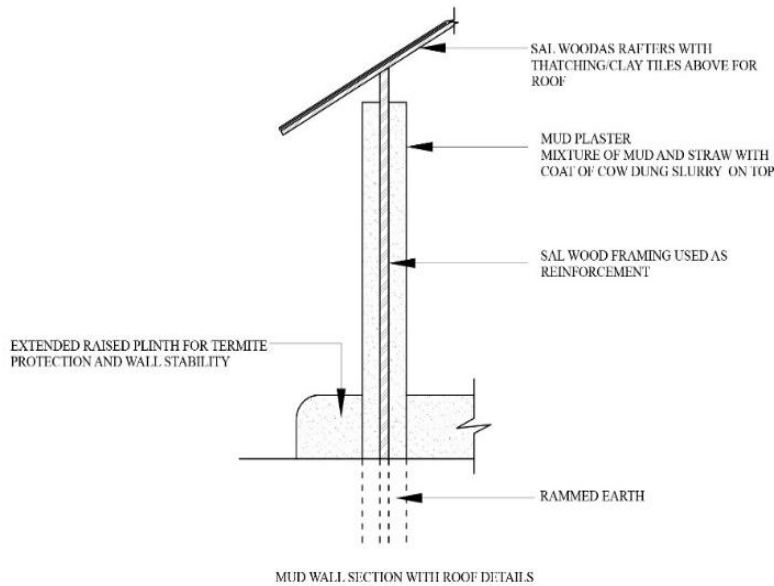


Figure 7:- Typical Mud wall section with thatch roof, Source: Author's own creation.

Discussions:-

The above facts and observations show the symbiotic relationship of the primitive tribe and forests. The livelihood, art and culture, beliefs and socio-economic framework is guided by the forests and at the same time is beneficial for the sustainability and conservation of forests. The basic functional needs of the tribe are very basic that get reflected in the style of architecture too. Present advancement in technology and urbanization lacks the sensitivity towards nature and its components, which is still retained among this community. Healthy interventions that can yield sustainability in the field of construction and is environment friendly is the call of time and the architectural practices these tribes follow serves as a great source of inspiration and learning.

Conclusion and future scope:-

Extension and application of the theory of vernacular architecture to the modern architectural style by incorporating required modification as per present needs will help reduce the construction waste, pollution and will enhance the sustainability quotient. Assessment of the appropriateness of the different vernacular methods and materials of construction which can be modified and used in present context, so that it responds best to the local climate and is sustainable, fulfilling the functional needs of the occupants, and is environment friendly. This would lead to the evolution of spaces to a more functional, safe, and vibrant place and add values to make the architecture sustainable, economically feasible, functionally viable, culturally relatable, and socially acceptable.

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