TRIBHUVAN UNIVERSITY

INSTITUTE OF ENGINEERING

PULCHOWK CAMPUS

THESIS NO: 076/M.Arch/007

Santhal Architecture of Terai region: A case of satar village Morang

by

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A THESIS

SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN ARCHITECTURE (M. Arch.)

DEPARTMENT OF ARCHITECTURE

LALITPUR, NEPAL

September, 2022

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ABSTRACT

Modernization in housing construction in rural areas leads to changes in traditional lifestyle. This study has developed a survey of Santhal architecture in the rural areas of the traditional settlements of satar and identify changing trends and study different attribute's role that somehow playing role in shaping santhal architecture. As indigenous peoples like santhal are diverse social and cultural groups, with ancestral connections to the land and natural resources they lived in, occupied or evacuated. Changes in community cultural and social attitudes have the greatest impact on architecture it not only diminishes architecture but also kills the social cultural practices which ultimately result to diminishes of their identity (Ismail, 2015). As a result, it appears crucial for sociocultural factors to support architectural identity. The Santal people seek to shape architecture and create their own identities through social and cultural attributes it plays an important role in identity formation. Each architectural element of Santa-House represents culture such as structure, morphology and design, and the use of raw materials determine their identity. Generally, Santhal builds a house from a local material that can be used locally instead of text craftsmanship so these reflects their identity it has to be preserved.

Keywords: Urbanization, Modernization, Santhal architecture, Vernacular architecture, Transformation

ACKNOWLEDGEMENT

I express my deep sense of gratitude to my thesis supervisor Prof. Dr. Sudha Shrestha for her tremendous effort on helping me in developing the thesis by providing all the necessary assistant. I also thankful to the department teacher for support and valuable inputs. This thesis would not have been possible without the guidance of Santhali people who contributed and extended their valuable assistance in preparation and completion of this study. I also thank my colleagues, for their support to complete this work.

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076-March-007

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CHAPTER 1. INTRODUCTION

1.1 Background

Our country consists of diverse identity based on religion and caste system. Different groups consist of own vernacular architecture that also reflect their identity. Among them, the Santhal or Satar community is a unique ethnic group in eastern Nepal. Although the population is small, accounting for only 0.19% of the total population of the country, they have a rich hunting culture and practices. The discovery of such an architecture is essential. The culture of each society is defined through its manifestations such as language, art, and architecture, and analysis in the field of culture involves the study of cultural expressions. Architecture as a matter of human life reflects the culture of each society in close interaction with structural, historical, political, economic and social features. People of all countries try to follow their standards and maintain their values by doing architecture by applying material things. Changing cultural and social attitudes in the community has the greatest influence on architecture (Ismail, 2015). Therefore, the role of culture in promoting architectural identity seems essential. The Santhali try to shape their architecture and create their own identity through social and cultural attributes. Oliver (2003) points out that the abode of each culture is interdependent and related to economic needs. Cultural values and social relations of residents. Thus, it plays an important role in the formation of identity. Each architectural element of the Santal house represents culture such as structure, shape and design as well as the use of raw materials. In general, the people of Santal build their homes from locally available raw materials rather than from crafting texts. They learn construction techniques and build their homes through direct experience and no written training. When building a house, they always pay attention to certain aspects such as architectural form, construction process, construction knowledge, cosmic knowledge, cultural beliefs and memories. For these cases, they maintain uniformity in their composition. These identical characters distinguish their homes from those of non-Santalian communities and thus become distinct identity markers (rai, 2017). As use of green materials and local workmanship can preserve emission of different harmful gases.

1.2 Statement of the Problem

Nepal is poor and developing country but rich in cultural context. The santhal is one of backward community with rich in cultural practices. Due to result of modernization santhal identity are diminishing so study on this vernacular architecture is essential. Thus, detail study of architecture of santhal architecture is needed in order find out the different attributes like social, cultural that shapes their architecture and changing trends of architecture (Bhattarai, 2015). As it can be seen that some of the houses in this locality are in changing pattern from green to grey it not only diminishes architecture but also kills the social cultural practices which ultimately result to diminishes of their identity (Ismail, 2015). Around the world, ideas and cultural values are being communicated more and more, social interactions are strengthened, and a globalized culture is born. This phenomenon leads to interconnections between different cultures and societies (Steger & James, 2010), but it threatens the feasibility of our local culture, values and traditions.It demonstrates the importance of studying this subject because

vernacular architecture studies concentrate on the use of regional materials and resources, which are generally sustainable and energy-efficient. As exploration on this architecture is very limited in Nepal. Thus, in context of Nepal exploration under this topic is still needed in order to preserve culture and identity of Santhal. The literature suggests there still gap in study about the adaptability of own culture tradition in santhal architecture thus it is also one of essential part to know their Architecture based on their culture. Thus, integrate study of vernacular architecture is very essentials.

1.3 Rationale of the Research

1.3.1 Need of Research

Nepal is poor and developing country but rich in cultural context. The santhal is one of backward community with rich in cultural practices. Due to result of modernization santhal identity are diminishing so study on this vernacular architecture is essential. Thus, detail study of architecture of santhal architecture is needed in order find out the different attributes like social, cultural that shapes their architecture and changing trends of architecture (Bhattarai, 2015). As it can be seen that some of the houses in this locality are in changing pattern from green to grey it not only diminishes architecture but also kills the social cultural practices which ultimately result to diminishes of their identity (Ismail, 2015). It demonstrates the importance of studying this subject because vernacular architecture studies concentrate on the use of regional materials and resources, which are generally sustainable and energy-efficient. As exploration on this architecture is very limited in Nepal.

Thus, in context of Nepal exploration under this topic is still needed in order to preserve culture and identity of Santhal. The literature suggests there still gap in study about the adaptability of own culture tradition in santhal architecture thus it is also one of essential part to know their Architecture based on their culture. Thus, integrate study of vernacular architecture is very essentials.

1.3.2 Importance of research

The improving the lives of santhali and preserve the identity of santhal community dwellers in is also one of the pressing developmental challenges which pose a threat to the local and national governments. As the modernization not only change their architecture but also discard cultural and social practices it may result in loses of their identity (Ismail, 2015). Moving from green to grey also hampers in environment because it results in large carbon emission. As our old vernacular architecture is green architecture which are energy efficient and more sustainable. This study also identifies the key element and hindrances for their development. It benefits for policy makers and also the architectural philosopher. It helps to identifies the issues of santhal and work under its eradication. This study helps to understand santhal architecture through socio- cultural prospective thus it ultimately benefits the local and national government to create Bylaws or any other plan in order to save their own identity (murmu, 2012). Further it also provides useful insights for different researchers and also for students in their academic's fields.

1.4 Research Objectives / Research Questions:

The research main purpose is to understand changing trends of santhal architecture integrating socio- cultural adaptation, sustainability development.

- This problem statement leads to following research objectives:
- What are the social-cultural role in shaping Santhal architecture?
- How the santhal architecture form has been changing from past to present and construction details of santhal traditional mud architecture?

1.5 Research Methodology

Analyses of both the qualitative and quantitative data were used in this study. For this study, a case study research methodology is suggested. The case study serves as a guide for the investigator as they gather, examine, and analyze observations. The researcher can make inferences and spot areas of generalization thanks to the logical pattern of the evidence. As no standard reference of design elements or approaches and case study research designs are not fully codified (murmu, 2012). According to research settlement planning process including people socio cultural adaptation and policy all are interrelated. These all are required for identify the social cultural role in shaping santhal architecture which is the main purpose of the research. Case study research demands theory development prior to data collection without the theory the scope of data collection remains undefined theory has to link the context and event. Hence case study is based suits in this research.

1.5.1 Conceptual framework of research

The nature of the research theme relates to the perception of people to understand their adaptation strategies in santhal architecture. It tackles about how people are adapting their socio –cultural need in santhal architecture where the space to live for themselves is too small. There are several ways of looking at this particular problem. The theme of the research which is examining the adaptation strategies of the people adapting to socio cultural space demand could not be approached from the positivist paradigm. As positivism refers to an evidence-based fact that can be explained mathematically. Positivism sets out to predict and control reality.It focuses heavily on the deterministic view of cause and effect (causality) derived from deductive reasoning, whereby research is guided by theory (Kinsler, 2011).

As qualitative analysis deals with the subjectivity of humans which cannot be converted into numbers such as interviews, notes, video and audio recording, images, and text documents that only cannot fulfill the requirement of this research. Therefore, a framework that combines the individual perspective to give a common idea about the requirement of space for generalization is needed. This system of thought clarifies the interpretation of alternatives for space demand fulfillment. Thus, this research is based on the pragmatic paradigm thus uses mixed method for analysis. As these research question required both qualitative and quantitative analysis. Thus, both analysis which most likely gives the research a proper feasible direction as a conceptual idea. Ontological claim people adapt their own culture tradition which can be represent in santhal community.

Epistemological assumptions are based on the adequacy and legitimacy of different kinds of knowledge that are possible. This research intends to produce knowledge about the adaptive strategies of people in santhal community in order to identify their identity by valid source of knowledge. Accordingly, this research has proposed to look into people's minds since it is the ultimate source of knowledge about how they adapt and fulfill their socio-cultural demand in santhal architecture

1.5.2 Research methods

The research method is the strategy used to implement the plan that answers research questions. This research uses a questionnaire survey, a structured questionnaire survey is used to measure the people's opinion, and the direct observation method and the interpretation of their social cultural content is used. The study of densely populated santhal community of terai region i.e. satar village of Morang. The research will be done best on field visit, direct interview, study reports etc.

1.6 Scope and Limitations

The study explores the socio- cultural role in shaping santhal architecture. It also detects change in material culture and its form past to present. Culture is a tool for achieving an identity that reflects an overall lifestyle that includes both material and immaterial elements (Ismail, 2015). Due to time limit study focus on construction details of santhal mud architecture only which is one of environment friendly architecture.

1.7 Time schedule

SN	Research purpose	Objectives	Deadlines
1.	Background research	Meet with supervisor for initial discussion	March 4 week
2.	Literature review	Conduct a more extensive review of relevant literature	April to May 1st week
3.	Research design planning	Design questionnaires identifying online and offline channels for recruiting participants	May 2nd week to June 1st week
4.	Data collection and preparation	Participant recruitment and questionnaire distribution Conduct semi-structured interviews with a small group of participants.	May 2nd week to June 1st week
5.	Data Analysis	Analyze survey data statistically Perform Thematic Analysis Create a draft of the results and discussion.	June 2nd week to July 1st week
6.	Report Writing	Finish the full thesis draft Consult with your supervisor for feedback.	July 1st week to August
7.	Revision	Redraft base on feedback Get supervisor approval	July 3rd week to August 2nd week

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction to architecture

Superior modern architecture, which pursues a certain formal character and the identity of the region, adapts the valuable aspects of maintaining the traditional architecture of the region "(writing, 1984: 54). These aspects should be fully understood and implemented in terms of the impact of climate on constructed forms, including microclimate and physical conditions. Glassie (1990) defines architecture as a physical embodiment of the cultural norms of individual buildings. He argues that the true indigenous tradition is based on participation, involvement, and the belief that all people are equal and deserve equal rights and opportunities. He states that many of these connections to power have been lost in modern society, leading to ignorance and the weakening of culture. According to Hockings (1985), the aspects of the form and the construction of the constructed form are linked to reveal the economic, spiritual and social structure of the cultural tradition through symbols, spatial relationships, socio-cultural interests, etc. There are ways to help you. ((Hockeings, 1985), 1985)

There are some common areas of interest that all of these terms or vocabularies have in common. These common areas make it difficult to depict terms clearly. The most popular term among these is "popular architecture" with linguistic comparisons with the general public. Architecture, like language, music, art, literature and food, is a unique part of national culture. Architecture is also the most visual of these cultural elements, with the Egyptian pyramids, New York skyscrapers, and Nepali temples all conveying a unique image. This is called "Genius", "spirit of place". Every country has its own genius trajectory, its own uniqueness. Indigenous architecture is made from local materials and is rooted in local customs and techniques passed down from generation to generation. The ecological, sociological, and political context of a location or region determines the architecture, which is a tangible embodiment of societal demands and aspirations. Each period of history can be associated with a genre of architecture that reflects the beliefs and achievements of the society it represents. It involves the interrelationship of built and open spaces within a larger landscape. Each period of history can be associated with a genre of architecture that reflects the beliefs and achievements of the society it represents. Characteristic images representing each era of history are engraved in collective memory. (Hockeings, 1985)

As a result, each region has developed an architecture that is a unique combination of climate responsiveness, imaginative use of local materials, resources, technology, knowledge and skills. traditions, religious and social customs, and represent a way of life through the common experience of many generations, this is why architecture is the architecture of a particular place, of a people. particular race, of a particular community. It has two generating forces - culture and context. Vernacular architecture dates back to when humanity was forced to utilize the natural resources that surround it and provide climate-adapted shelter and comfort, a shield against the elements. open, leading to different space options. A variety of locations, economics, technology, inherited skills, social and familial structures, belief systems and symbols, and many other elements influence the diversity of construction forms in many civilizations, despite the fact that housing makes up the majority of the world's buildings.

Greater senses of belonging and place have generated elements of social and symbolic values with a definite background a purpose. It is a spiritual entity, an expression of the cosmic or divine mode. The ultimate goal is how it relates to the time it was built, how it relates to its surroundings, and how it relates to the people who built it and lived there. Is to understand. It's object-oriented, social-oriented, cultural-oriented, and symbol-oriented (Eisenman, 1970). Since the beginning of the Enlightenment, civilization has been primarily interested in instrumental reasons, but culture has focused on the details of expression: the realization of existence and the development of its collective social reality. The dialectical interaction between civilization and culture offered the possibility of retaining some general control over the form and meaning of urban structure. – Towards Critical Regionalism: Kenneth Frampton, Six Points for the Architecture of Resistance. "Architecture affects everyone because of its size and public character, and to provide a very clear mirror to the kind of society in which we live, such as social relationships. The word architecture means a permanent building suitable for a variety of human activities, and also suggests communication of ideas, emotions and experiences through forms. The most important movement in is the revival of traditional and classical traditions and the reintegration of their basic aspects into the mainstream of modern architecture: the structure of communities, the construction of cities, January 1991, NY. Times, Vincent Scully. Tradition can be defined as the process of interpretation, adaptation and negotiation under given conditions and has been passed down from generation to generation to meet the needs and challenges of the times. But as we move towards globalization, if the global becomes too local, international architectural styles dominate every skyline, regardless of local climate or culture. This new genre of architecture is completely separated from tradition and destroys the traditional knowledge base developed over generations (Eisenman, 1970).

2.2 Characteristics of good architecture

Over 2,000 years ago, Roman architect Vitruvian defined three features of excellent architecture in his treatise De Architectura. Interestingly, it is the only surviving text from ancient times that describes architecture. Contemporary architects have collected many important lessons from 10 books on the architecture of Vitruvius. And perhaps it is the three standards of his architecture that have endured the test of time. It is also known as the Vitruvius triad: Venustus, Utilitas, Firmitas. These principles are as follows:

Durability (Firmatis) – Must be sturdy and in good condition. Firmitas is the ability of a building to remain durable after long periods of use and exposure to natural elements. Over time, architects have become able to more accurately calculate the expected life of a building. Certain materials such as marble, concrete and brick are durable and have a good appearance for durability. It can also estimate the range of Firmitas can also estimate by the age of the building. If a building survives decades without major renovations, it has proven to be a reliable and reliable structure.

Utilitas- Utilities are the ability of a building to reasonably anticipate and respond to intended resident needs. Of course, you can judge the importance of practicality by witnessing all kinds of programs that can maintain a building, such as hospitals, schools, homes, and offices. Each of these programs requires a unique relationship with the site, as well as specially sized spaces

and conditions. In 1896, Luis Sullivan explained the concept of utility in architecture with his famous "form follows function". He wrote this thinking about the near future of skyscrapers. He said that if skyscrapers are an important element of the city, special attention should be paid to their daily use and function (Eisenman, 1970).

Beauty (Venustatis) – She is said to please people and enhance their spirit. Venustas (beauty) is the relationship between a building and the aesthetic standards of its context. This element can be made visible using attractive buildings and flooring. Other aspects to consider are: the level of craftsmanship and attention to detail (how walls and floors meet was a serious concern for architects interested in beauty). Venustas was a requirement for most new buildings before the 20th century. However, after that, the focus on architectural design became less focused. Some say this is due to increased mass production. This requires components that are easy to reproduce. Others suggest that the general public has become too indifferent to the potential of architectural beauty. This is because it has been introduced in complementary architectural elements such as elevators and air conditioners. Fortunately, some architects still put Venusta of Vitruvius architecture at the center of the goals of the entire design process (Hockeings, 1985).

2.3 Vernacular Architecture climate responsive design

2.3.1 Vernacular Architecture meaning and concept

Vernacular architecture can be defined as a local or regional type of building, using materials and traditional resources of the area where the building is located. The building is thus closely linked to its context and is perceived and strongly influenced by the geographical features and cultural aspects of its environment. For this reason, they are unique to different places of the world, and even serve as a means of confirming their identity. Vernacular architecture has been revisited and redefined in many modern building practices and these buildings play an important role in today's society as they offer outstanding biological performance and are proven by concrete examples of architectural sustainability. For this reason, ancient architectural approaches are explored and replicated, for example, in projects aimed at reducing CO2 emissions to the environment while maximizing energy efficiency through passive noise and temperature control (Zhai et.al., 2010

It is distinguished by its unique location-specific requirements, construction methods, and reliance on tradition. This kind of architecture is unique to the time and place in which it was created and cannot be found elsewhere. Historically,
local architects' talents and knowledge have been used in traditional architecture rather than architects with formal training. Primitive, nomadic, or traditional architecture are often associated with the term, but it can also refer to certain styles and architectural designs seen in developed nations and metropolitan communities. Since native architecture has so many different parameters, it is challenging to come up with a single definition. In regards to the classification of vernacular architecture as architecture, there are also discrepancies between theorists and academics. Vernacular architecture, according to the World Encyclopedia of Indigenous Architecture, "includes dwellings and all other constructions of the people." They are frequently constructed by owners or communities using conventional technology, within

the constraints of the surrounding environment and the materials at hand. All varieties of vernacular architecture are created to fulfill certain requirements as well as the values, economies, and lifestyles of the cultures who created them. (Olive, 1997, Encyclopedia of Vernacular Architecture) According to Frank Lloyd Wright, "the common building evolved according to practical need, which was better adapted by people who knew nothing better than to adapt the environment to suit the wants of the world." local flavor. He suggests that it is a simple type of design that lacks sophisticated thought, but he also claims that it is much better, particularly in Europe. One of the pioneers in creating a fresh approach to researching historic house forms using specially created methods was Amos Rapoport. No of the culture, a traditional house is always the culmination of several and distinct lines of evolution. Rapoport bases his factorial analysis on native dwellings, which contain several components with their own evolution, including roofs, entrance gates, windows, and walls. House shape can be directly related to cultural behavior patterns, cultural ideals, and cultural worldviews when it comes to sociocultural influences.

Lewis Henry Morgan investigated this concept using factor analysis and identified various types of social behavior and customs among Indian tribes that could be related to their homes (Egenter et al, 2005). The evolution of houses from simple shelters to complex structures. The majority of vernacular houses are so named because of the building materials, space, and form. The best game changers are materials, construction, and technology).

2.3.2 Characteristics of vernacular architecture

Scholars' descriptions of native structure features can be summarized as follows: theoretical or aesthetic absences; work on site (eg adaptation to microclimate); respect for others and their home, and thus the environment as a whole; artificial as well as natural; and work in an idiom with variations in a specific order. There are several distinct variants inside a framework that may be changed in various ways. Although vernacular has always had a restricted range of viable phrases, it can adapt to many different contexts and find a place in each of them. Of fact, it is precisely this constraint of expression that makes any communication impossible. To communicate, one must be willing to learn as well as utilize language that suggests authority acceptance, trust, and a common vocabulary. Another feature of native is its additive quality, its open and unspecific nature, which distinguishes it from the closed final form typical of most stylistic designs. This trait allows vernacular structures to absorb alterations and additions that would damage a high style design aesthetically and conceptually ((Taut, 1958) Vernacular is further distinguished by the increased emphasis and significance of interactions between elements, as well as the way in which these relationships are produced, rather than by the elements' nature. However, this takes us into the area of urban design. Vernacular dwellings are the product of many individuals working together over many generations, as well as collaboration between builders and users of buildings and other artifacts. There is no need for drawings or designers because everyone is familiar with the conventional model. A home is synonymous with all well-built residences in a specific region. The design is straightforward and simple to understand. Because everyone understands the rules, the artisan was not summoned until he had a more in-depth understanding of them. Size, layout, occlusal

proportions, and other criteria can be set by conversation and, if required, in writing. Aesthetic excellence is not developed for each residence; it is customary and passed down from generation to generation. As a result, it is accepted and obeyed, because honoring tradition gives communal control and acts as a discipline. Because there is a shared vision of life, this traditional technique works. living, an approved building form, a limited number of building kinds, and eventually an acknowledged hierarchy and, as a result, an established pattern of settlement These shared and recognized pictures will continue to operate as long as the custom exists. As tradition fades, so does the image. There can be no beliefs in accepted standards without tradition, and institutionalization starts (Taut, 1958).

The evolution of vernacular architecture is centered on the purposes that the building type must fulfill. Following that, the design often changes throughout time, being modified and adapted for existing situations such as: (Zhai et.al., 2010).

• The availability of resources, such as skilled labor.

• Localized technology.

• Climate: The quantity of sunlight, humidity, rain, wind, temperature profiles, and other factors.

• Local culture: The style of life of the occupants has a significant impact on the building shape. This might include family size, how the structure is utilized, socioeconomic conditions, local norms, religious beliefs, and other factors.

• Environment: Whether it is near water, woods, desert, or mountainous terrain, for example.

• Economic circumstances.

2.3.3 Principles of Vernacular architecture

2.3.3.1 Constraints

It has a significant impact on sustainability. However, the most significant limitation on the design decisions we make should be sustainability. We may simply restrict ourselves to materials that fit our notions of sustainability.

Vernacular architecture principle

The following local language principles can serve as inspiration and guidelines for addressing housing concerns in a specific location while also preserving and enhancing the environment. Design specialists must give ongoing leadership in incorporating these concepts into design as much as feasible (JM Previtali, 2010)

2.3.3.2 Participatory paradigm

The task of providing inclusive housing for a growing world population in the 21st century is a challenge, especially in cities in developing countries. The lodgers and slums will continue to represent the way shelter is defined for the majority of city dwellers. This is because squatters use traditional and native means to build their shelter. They use the most cost-effective self-help process and participatory mechanism, to the extent they can, build with local materials and do so step by step to improve homes and adapt with their growing family. The tradition of

user involvement in planning and construction is only just beginning to be appreciated and used in many companies. Design flexibility and usability is another feature of the native build mode. Buildings can be used for a variety of tasks and are easily adapted to transform for multiple uses. other uses during its existence, reducing the pressure on environmental and energy resources compared to the construction of new structures and the demolition of old structures. Current construction practices are often designed for unique and specialized uses, prohibiting the concept of flexible design and variable choice. This is in sharp contrast to the practice of creating native languages that meet the changing needs of not only current users but also the needs of multi-generational users (S Bodach, 2014).

2.3.3.3 Diversity and perception of place

Indigenous communities are characterized by compact shape, effective land use, and ecosystem building, all of which have several environmental benefits. Environmental, economic, and social benefits when compared to the scattered base that defines our modern cities Indigenous settlement towns and villages are distinguished by an extraordinarily dense urban environment of structures and tightly coordinated land uses with a high degree of intricacy and cohesiveness. As a result, there is a rich cityscape with outstanding taste and a distinct cultural past. Indigenous communities wrapped in simplicity aid in the design and creation of a location that fosters spontaneity. This characteristic provides an urban cultural foundation, allowing inhabitants to interact with their communities. Shelter in indigenous communities is suited to unique lifestyles and cultural traditions, and is supported by family values and a feeling of community. Traditional vernacular architecture considers the structure to be a living architectural organism in and of itself, formed by particular social and cultural demands. (2012) (JEP Fernandes)

2.3.3.4 Local materials and regional flare

Vernacular architecture is a literal reflection of the materials used and the manner of building utilized by skilled and competent users. Local materials are less expensive and more readily available than imported industrial items. They are easily accessible to the majority of the populace who are capable of building their own homes. In various places of the world, local builders employ adobe brick and rammed earth to construct housing. The adobe material has shown to have excellent insulating properties in hot dry climates, protecting indoor living areas from the intense sun and outside heat. To keep homes inexpensive, local materials and basic construction techniques are acceptable for a wide spectrum of individuals. Local materials need less shipping and, in certain situations, less energy to manufacture. They are quickly adaptable to the environment. Vernacular architecture demonstrates prior building design techniques that should be studied. It is distinguished by recurrent attempts at improvement across subsequent generations, with the goal of making the greatest use of the limited resources available, such as energy conservation and ecology (JEP Fernandes, 2012)

The new construction operations should acknowledge the natural energy systems at work in the built environment and strive for a symbiotic interaction with its surroundings. Learning and

expanding on vernacular construction ideas that have offered long-term answers to their energy demands. Recognizing the microclimatic variables of a building's location helps improve many of the building's natural energy patterns. A distinct microclimate is created by building and site orientation to sun exposure, wind, the influence of plants, and their arrangement in space. The optimal design of open areas, streets, gardens, and courtyards has a substantial impact on a site's and buildings' sustainable energy patterns. In addition to direction, building materiality, surface roughness, and colors of visible building surfaces also contribute to the energy pattern. In an era of globalization, when the trend is toward cultural homogeneity and, as a result, techniques of constructing in vernacular architecture is a major element in the conversation about cultural identity and the viability of returning. Vernacular architecture could contribute towards reducing waste and energy consumption through the use of passive solar design, traditional techniques and local materials, in a process of on-going development in which solutions are adapted for specific cases, in accordance with territory and climate (JEP Fernandes, 2012) (JEP Fernandes, 2012)

2.3.4 Factors affecting vernacular architecture

2.3.4.1 Climate and need for shelter

Climate determinism, according to Archer, was widely accepted in both architecture and cultural geography, though the latter was believed to be less favorable. When one considers the function of climate in the creation of architectural shapes, one cannot ignore its significance. The still-popular climate-determining approach in architecture claims that early man was primarily concerned with habitation, and hence environment decides form is vital. As a result, humans create shelters to keep our environment steady and predators at bay. To maintain our metabolism, we cultivate, collect, and consume food (Archer, 1963). While this is debatable in terms of housing or food now, it is not true for primitive man, who had various habitation variations as well as dietary taboos and prohibitions within his scarcity economy.

2.3.4.2 Material and Technology

Mud walls or adobe block walls are used in earthen houses. This form of structure is common in many cultures, particularly among poor communities that lack access to more complex building materials. Adobe structure has a low seismic resistance; nonetheless, there are a few ways for improving earthquake protection in these buildings. One technique is to carefully select the form of the structure (preferably a circular floor plan). To attain the appropriate seismic performance, the floor layout must be fully regular. It should be symmetric in both orthogonal directions if feasible. Another approach used is to strengthen the walls with wood. Because wood reinforcements are effectively protected against moisture, they may be incorporated to strengthen ductility and secure connections. and insects (such as termites in Africa and India). This provides long-term structural stability, as well as the use of a lightweight roof to decrease bulk on top of the walls; a stable roof-to-wall connection is required for excellent seismic performance. There are two types of Bhonga roofs: traditional thatched roofs and more contemporary clay tile roofs. Clay tile roofing was most likely chosen because it gives better thermal comfort than thatched roofs. However, because of the high

overhead masses, it has a negative impact on the seismic response of such dwellings. Furthermore, the tiles are dangerous since they regularly collapse if they are no longer securely attached to the roof framework. The importance of roof type in traditional adobe dwellings has been demonstrated by earthquakes. A light-weight roof, such as a thatched roof, is common in conventional dwelling construction. The bulk of vernacular housing structures employ masonry walls as the load-bearing framework. The most basic approach is to use sun-baked blocks, commonly known as adobe as discussed in the preceding section. Where wood or coal fuel is available, the usage of burnt clay bricks is prevalent. Clay brick has been used for millennia in various regions of the world as a construction material. In certain areas, stone is the most readily accessible material. Unshaped stone blocks have been used to create dwellings from ancient times, particularly in the form of uncaused (random) stone-rubble architecture. The stones have been carved on occasion, primarily using hand tools. This kind of construction is known as dressed-stone masonry. The use of wood, a lightweight and pliable building material, provides the advantages of wooden dwelling construction. An essential consideration in timber construction is the capacity of connections (floor beams, post beams, or beam panels) to transfer pressures from one building part to another and then down. fundamental. It should be remembered that wood is highly sensitive to moisture and insect damage. Furthermore, the usage of building lumber is restricted due to the scarcity of suitable wood supplies in the area. The loadbearing structure is made up of wooden poles that create a frame that is surrounded with felt tension fabric. These dwellings feature a circular design and are extremely light. (Kyrgyzstan, WHE Report 35)

2.3.4.3 Site

Similar site circumstances can result in very varied home forms, while similarly shaped houses can be erected on drastically different sites. Water, like site, may be handled by constructing on the water as a navigator, onshore, or with a houseboat. Some things are difficult because of the location, such as having a houseboat when there is no water, but all shapes have been utilized and have variants. Quite identical places frequently have very distinct forms; for example, we can point our sight at or turn your back on the coast. Even spectacular environments such as mountains, deserts, and rainforests produce a wide range of housing shapes. As previously stated, geography influences both the city and the House, although it does not dictate the form. The Vidal de la Blache stated in Amos (1969) may be corrected by saying that "nature provides the location and man organizes it to enable him to meet his desires and requirements." In some ways, the impact of place is more cultural than physical since the ideal location depends on the aspirations, ambitions, and principles of a people or era, and the decision of what is "correct"—a lake, river, mountain, or coast—depends on this cultural definition. The usage or neglect of the mountain range could not be related to how people feel about them, but rather to how difficult it is to get to them. 1962's Defontaines. The choice of location could be influenced by paranormal elements or partly by political and social viewpoints Issawi, October 27, 1966). Places of attraction vary equally within cities. The position of the crafts "upper" directly around the mosque and the "lower" ones further away is typical of Muslim communities, a pattern irrespective of the nature of the real site. It was

brought to Mexico by Spaniards (who most likely acquired it from Arabs), and in the same region we have both Indian communities with a random distribution of jobs and Spanish cities with the "Islamic" model of "noble" professions and affluent homes crowded around Plaza

2.3.4.4 Economics

Economics has been frequently utilized to explain various kinds of settlement and development, and its significance is undeniable. In a finite economy, the desire for survival and maximum resource use is so intense that these forces can be expected to wield considerable power. If, even under these conditions, economic factors other than prevail, the case for the economy as a cog and ally becomes less compelling. Even in limited economies, there are several cases of shepherds living near farmers who not only rejected the pre-existing economy, but also resented those who practiced it. Babenga and Pygmies traded crops and games without abandoning their traditional way of life (Rasmussen, 1960). Because of the social and religious significance of cattle, the Masai, Bakitara, and Banyankoli people of East Africa reject the economic opportunities presented by the models around them and treat their animals carelessly (Mikesell, 1962). One could anticipate that they would be less impacted by simple economic necessity because shelter is not as essential to existence as food. In Annam, there are more wealthy households than wealthy families because as soon as a farmer has money, he constructs a house that is beautiful but not very comfortable and above his means. In general, economic life does not have a significant impact on the shape of the home since persons with the same economic background may have various moral systems and worldviews and because the house is an expression of the worldview. Even the absence of labor specialization that characterizes early societies and, to a lesser extent, vernacular builders, may be linked to social and cultural rather than economic motives. Economy and skilled labor may be disparaged. Even cooperative construction may be motivated by social pressure rather than economic need or task intricacy. A prime example is Cebuan housing in the Philippines, where building without social collaboration, goodwill, and community is more cost-effective (Hart, 1959)

2.3.4.5 Climate responsive building design

One of the key prerequisites for guiding the building industry toward sustainable growth is climate-friendly design. Design strategies are created using climatic elements in climate-aware design. We may use less energy to heat and cool our building by fully using the climatic elements (temperature, relative humidity, wind, solar radiation, precipitation). The structure is intended to produce the ideal environment for human comfort. A person's experience of whole physical and mental well-being in a built environment is referred to as comfort (Givoni, 1998). The buildings outside walls may be improved, raising the temperature of the inside at night by 3.9 ° C. (Rijal H.B., 2005). After doing conventional heat measurements and thermal comfort studies, it was determined that the soil floor and muddy roof's passive heating effect was to blame for the kitchen's temperature being 9.6 ° C higher than the outside temperature. The construction industry in Nepal has embraced a uniform design and construction technique that disregards the local environment since contemporary building technology was introduced to the nation. WECS (2010) estimates that 89% of Nepal's total energy consumption is accounted for by the country's housing sector. use of the climate-friendly building design strategy in a

major way throughout the design stage might result in considerable energy savings in dwellings. Additionally, Shrestha et al. (2019, 2020) underlined that user behavior is significantly impacted by the possibility for energy savings. The native home was created largely to make the most use of available natural resources, such the sun and wind, due to the absence of heating and cooling technology at the time. Traditional knowledge developed through trial and error is what led to the development of vernacular architecture. According to several studies, national buildings are more environmentally friendly than contemporary buildings because they make the greatest use of locally available resources. Vernacular architecture is a word used to describe how structures are constructed utilizing materials that are readily accessible in the area to satisfy local requirements. According to Shin et al. (2010) Resident, residents have more influence over their homes' internal environments because they have the freedom to alter their personal and environmental circumstances.

2.3.4.6 Climate-responsive design strategies for Nepal

Improved air circulation is essential for Nepal's subtropical climate. It is recommended to arrange a room A single bank provides regular air circulation. Example: By cross ventilation or ductwork. According to Mahony, the rows of houses should be arranged in the North - South direction (vertical axis) East - West) to reduce the absorption of solar heat, especially in the hot season. The ventilation should be moderate (20-40% of the outer wall surface) and avoid direct sunlight in the summer Sunshade equipment. High thermal mass with night ventilation performance It provides thermal comfort, especially during hot and dry summer months. However, lightweight materials are recommended during the hot monsoon season. Light roof and high insulation Recommended for this climate. Olgyay and Givoni are depicted in an image. The diagram illustrates how solar radiation in the form of passive solar heating can be sufficient to provide thermal comfort for short periods of time (Givoni, 1998).

2.3.4.7 Sub-tropical climate

Tharu houses, santhal houses, and other types of homes are included in the examination of vernacular architecture in Nepal's subtropical environment. The widespread tropical monsoon environment requires that homes be shielded from the heat and heavy rainfall it brings. The main local resources employed are cane, timber, and thatch. They contribute to the creation of a comfortable "breathing" house, in which the building envelope is more permeable and enhances natural ventilation.

i. Settlement and housing pattern of Terai region

The traditional settlement pattern in subtropical climate of Nepal is rather loose than dense. Santhal houses are either loosely situated along the road or they create clusters with open or semi closed compounds. The houses are arranged around a courtyard that is open to at least one side so that breezy winds can flow through the settlement and have wide open yard in front of each house. This facilitates easy penetration of air through the houses. Form and orientation of a building the structures have a single floor with a mezzanine that is used for storage, rectangular or square floor designs, and low walls around them. They have

comparatively small ventilation that is strongly needed in this hot and humid climate. The house is arranged in linear pattern. The interior area is nearly unbroken, which facilitates a constant natural circulation of cold air from the shaded area beneath the eaves. Traditional settlement patterns in the subtropical climate of Nepal are quite loose rather than dense. The house form semi-enclosed clusters and are arranged around a courtyard Open at least one side to allow strong wind to circulate through regulations. This makes it easier for air to penetrate through the houses.

a. Shape and construction direction:

Buildings with enclosed rectangular floor plans with low walls, sometimes no higher than 75 cm. They have typical longhouses. shaft. The longest facade is usually in the north-south direction reduce sun exposure.

b. Story building and interior space arrangement:

The majority of the indigenous homes in Terai are one-story structures with a storage mezzanine on the ground floor. In order to promote the long-term ventilation, which is so important in this hot and humid climate, they feature high ceilings. The nearly open interior space encourages the constant natural movement of fresh air from shaded areas beneath eaves. The greenhouses under study contain a single component that does not reach the ceiling to allow for unobstructed airflow.

c. Wall

Traditional areas have relatively thin walls, notably those made of wattle and daub. The upper portion of the outside walls is made of loosely woven bamboo strips, and an open grid enables both continuous ventilation and illumination. Reed or wood walls don't have random gaps. Thin rattan rugs fastened to a wooden frame, plastered with mud, and painted white can also be used to create outside walls.

d. Roof

The majority of Nepal's traditional thatched roof triangles are constructed for subtropical temperatures. Indoor temperatures are often significantly lower than external temperatures thanks to the openings at either end and the low windows, which enable a steady flow of air from the shaded region under the eaves. (Hart, 1959)

Table 1: Vernacular architecture of santhal

Description	Vernacular architecture
Ethnic	Santhal
Settlement pattern	Group
Color and textures	Natural color
Building form	Rectangular/square
No. of floor	1
Roof	Thatch
Attic space	Used store
Material	Bamboo
Flooring	Mud and cow dung
Wall thickness	0.1
Ventilation	Small

(Source: Hamhaber, 2012)

Table 2: Design strategies of sub-tropical region

Features	Subtropical Design strategies
Main strategy	Passive cooling
Site planning	Deciduous trees at east and west
Layout/Spacing	Open spacing for breeze penetration and compact layout
Building orientation	Orientation north and south (long axis east-west)
Air movement	Single blanked room for small ventilation
Opening size and location	25–40%, at body height on the windward side, in the north and south walls
Material technology	Light walls, slope/ flat roof with insulation
Building envelope, texture and color	Light smooth finishing

(Source: Hamhaber, 2012)

2.4 Green architecture

Vernacular architecture is also green architecture or green construction which minimizes the adverse effect in environment. A construction strategy known as "green architecture" or "green design" tries to reduce the negative consequences of construction projects on the environment and human health. A "green" architect or designer uses environmentally friendly building materials and construction techniques in an effort to protect the air, water, and land. Environmentally friendly activities, from building design to landscaping choices, are referred to as "green." It is also about using energy, using water optimistically and economically, and

reusing stormwater and wastewater. Through better layout, design, construction, operation, maintenance and relocation, a sustainable building, also known as a green building, is the result of a design philosophy that focuses on increasing efficiency of resources in the use of energy, water and materials while reducing the building's impacts on human health and the environment throughout the life of the building. The term "green building" applies not only to products, but also to building strategies, design and construction practices, and promoting the economic health and well-being of families, communities, and communities. copper and the environment. Green building is a wise choice to maximize personal financial benefits and has a beneficial, affirmative and attractive social and environmental impact for the future. Buildings have a huge impact on the environment, using about 40% of the natural resources extracted in industrialized countries, consuming nearly 70% of electricity and 12% of drinking water, and generating from 45 % to 65% final waste. Landfills. In addition, they are responsible for a large number of harmful emissions, accounting for 30% of total greenhouse gas emissions, due to their activities, and an additional 18% indirectly due to extraction and transportation (Singh, 2018). At the same time, poor indoor environmental quality can lead to health problems for office building employees, reducing work efficiency which is essential. From an environmental impact point of view, the built environment and material and layout choices seek to find alternative sustainable building materials and low-tech methods that deliver more sustainable results. Using green building materials is a wonderful thing. The sustainable growth of a country benefits from choosing building materials with the lowest possible environmental impact. Therefore, the impact of buildings on environmental issues is significant (Singh, 2018).

2.4.1 Green architecture and green design

The Green Building contains around general agreements and specifies what is meant by environmentally friendly architecture in all classifications (Burcu, 2015). Many of these characteristics can be shown:

- Ventilation system for efficient heating and cooling
- Energy efficient lighting and appliances
- Water-saving sanitary fitting
- Planned landscape to maximize passive solar energy Minimal disruption to natural habitat
- Alternative energy sources such as solar energy and wind power x non-synthetic, non-toxic material
- Locally procured wood and stone
- Responsibly harvested timber
- Subsequent adaptive use of old buildings
- Use of recycled architectural salvage
- Efficient use of space

Most green buildings do not share all of these characteristics, but the ultimate goal of a green architecture is to be completely sustainable (Singh, 2018)

2.4.2 Principles of green Building design

Understanding the site in all of its complexity and beauty is the first step in creating an eco-friendly construction. The goal of an ecological design approach is to seamlessly incorporate a new system into the natural ecological processes already taking place there. These ecological processes contribute to the formation of habitat, responses to the sun's path, air purification, and the collection, filtration, and storage of water. Species that flourish in natural ecosystems may also inhabit habitats produced using man-made structures, which can be designed with features that imitate the operation of a certain ecosystem species. To promote biodiversity and thriving ecosystems, it is especially crucial to create new habitats in urban buildings. The following list provides a summary of the key ideas, strategies, and technologies related to the five crucial elements of green building design (Singh, 2018).

- Water Saving and Quality
- Energy and Environment
- Indoor Climate Quality
- Material and Resource Conservation

While promoting the use of the USGBC LEED Green Building Rating system, this information focuses more on general ideas and approaches than on particular approaches or technology. They typically vary from project to project and are dependent on the environment (USGBC).

2.5 Passive Solar Design

Passive solar design refers to using solar energy to heat and cool living spaces through solar radiation. Materials used in construction can transmit, transmit, and absorb solar radiation when it strikes a building. Additionally, air movement in the planned space is predictable due to heat from the sun. These fundamental reactions to solar heat led to design elements, material selection, and placement that can provide home heating and cooling benefits. Unlike active solar heating systems, passive systems are simple and do not require extensive mechanical and electrical equipment such as pumps, fans and electrical controls to move solar energy.

2.5.1 Passive solar design elements

2.5.1.1 Aperture/ Collector

A large glass section to let light into the structure. During the hot season, doors must be facing true South from 9:00 am to 3:30 pm every day, and they cannot be blocked by any other buildings or trees (BN Anderson, 1978). Absorber The storage element's surface is rough and dark. Whether it is a stone wall, a floor, or a water tank, the surface is directly in the path of the sun. When sunlight strikes a surface, heat is produced.

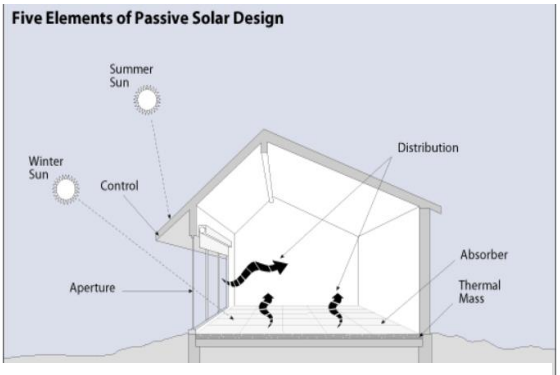


Figure 1: Five elements of passive solar design (BN Anderson, 1978)

2.5.1.2 Absorber

Surface of the storage element is hard and black. The surface is in the direct line of the sun, whether it be a stone wall, a floor, or a water tank. Heat is created when sunlight hits a surface. (1978, BN Anderson)

2.5.1.3 Thermal mass

a substance that traps or holds onto solar heat. The thermal mass is the substance beneath and behind the exposed surface, whereas the absorber is that surface (BN Anderson, 1978).

2.5.1.4 Distribution

a system that distributes solar heat throughout the home from a heat gathering point. The only three natural heat transmission modes employed in a completely passive design are conduction, convection, and radiation. Some applications permit the use of blowers, ducts, and fans to distribute heat across our house (BN Anderson, 1978).

2.5.1.5 Control

In the summer, open spaces can be shaded by roof overhangs. Electronic sensing systems, such as differential thermostats that tell the fan to turn on, vents and function registers that enable or restrict the flow of heat, low emission curtains, and canopies are further devices that regulate overheating (BN Anderson, 1978).

2.5.2 Passive solar heating

The objective of passive solar heating is to retain a reasonable indoor temperature by capturing solar heat in certain areas of a structure and releasing it when the sun isn't shining. South facing glass and heat blocks, which can absorb, store, and transport heat, are the two major components of passive solar heating. There are several ways to use these elements in practice (Littlefair, 1998).

2.5.2.1 Direct gain

The living space is essentially a system of collecting, absorbing and distributing solar heat. South facing glass welcomes solar energy into the house when it shines on the ground and masonry walls, has the effect of absorbing and storing solar heat, reflecting back to the room at night. These thermal mass materials are usually dark in color to absorb as much heat as possible. Thermal mass also softens the heat intensity of the day by absorbing energy. The water tank inside the living space can be used to store heat. Water, on the other hand, requires a correctly built structural support, which makes it more difficult to integrate into the design of the house than it is to build with bricks. Direct amplification systems use 60-75% of the solar energy entering the window. For a direct amplifier system to work properly, the thermal block must be isolated from the outside temperature to prevent the absorbed solar heat from being dissipated (Little Fair, 1998).

2.5.2.2 Indirect gain

The thermal mass is located between the sun and living space. The thermal mass absorbs sunlight hitting it and transmits it to the living space by conducting electricity. The indirect amplification system will use 30-45% of the solar energy hitting the glass adjacent to the thermal block. The most common indirect amplifier system is the Trombe wall. The thermal block, a masonry wall 6 to 18 inches thick, located directly behind the single- or double-sided glazing on the south side, is mounted approximately 1 inch or less in front of the wall surface. Solar heat is absorbed by the dark outer surface of the wall and stored in the bulk of the wall, where it radiates out into the living space. In the late afternoon or early evening, solar heat passes through the wall and reaches the rear surface. When the internal temperature drops below the temperature of the wall surface, heat will be radiated into the room. The Trombe wall is the most popular type of indirect amplifier system. The thermal block, a masonry wall 6 to 18 inches thick, located directly behind the single- or double-sided glazing on the south side, is mounted approximately 1 inch or less in front of the wall surface. Solar heat is absorbed by the dark outer surface of the wall and stored in the bulk of the wall, where it radiates out into the living space. In the late afternoon or early evening, solar heat passes through the wall and reaches the rear surface. When the internal temperature drops below the temperature of the wall surface, heat will be radiated into the room (Littlefair, 1998).

2.5.3 Passive solar cooling

The passive solar cooling system works by reducing unwanted heat gain during the day, creating a non-mechanical ventilation system that exchanges warm indoor air for cooler outdoor air. when possible and stay cool at night to moderately warm daytime temperatures. In its simplest form, a passive solar cooling system consists of an overhang or curtain on a south-facing window, shade trees, heat block, and cross ventilation (Littlefair, 1998).

2.5.3.1 Shading

To reduce unwanted summer heat gain, all windows should be covered with overhangs or other devices such as awnings, shutters and trusses. If the awning on a south-facing window protrudes half the height of the window, the sun's rays will be blocked in the summer, but still enter the house in the winter. The sun is low on the horizon at dawn and dusk, so the overhangs of east and west windows are not effective. Try to minimize the number of east- and west-facing windows if cooling is a major concern. Vegetation can be used to shade these windows. Landscapes can generally be used to reduce unwanted heat gain during the summer (Littlefair, 1998).

2.5.3.2 Thermal mass

In the passive cooling design, thermal mass is used to absorb heat and slightly increase the interior temperature on warm days. During the night, the heat mass can be cooled using a ventilation system, allowing it to be ready to be reabsorbed the next day. The same heat block can be used for cooling in the hot season and heating in the cold season (Littlefair, 1998).

2.5.3.3 Ventilation

The thermal mass is located between the sun and living space. The thermal mass absorbs the sunlight hitting it and transmits it to the living space by conducting electricity. The indirect amplification system will use 30-45% of the solar energy hitting the glass adjacent to the thermal block. The most common indirect amplifier system is the Trombe wall. The thermal block, a masonry wall 6 to 18 inches thick, located directly behind the single- or double-sided glazing on the south side, is mounted approximately 1 inch or less in front of the wall surface. Solar heat is absorbed by the outer dark surface of the wall and stored in the wall's volume, where it radiates to the living space. In the late afternoon or early evening, solar heat penetrates the wall and reaches the rear surface. When the internal temperature drops below the wall surface temperature, heat is radiated into the room. The Trombe Wall is the most common type of indirect amplification system. In the late afternoon or early evening, solar heat penetrates the wall and reaches the rear surface. When the internal temperature drops below the wall surface temperature, heat is radiated into the room (Littlefair, 1998).

2.5.3.4 Convective cooling

It is the oldest and simplest form of convection cooling designed to draw in cool nighttime air from the outside and push warm air out from the inside. During nighttime winds, high or open leeward vents allow warm air to escape near the ceiling. Lower vents on the opposite (windward) side bring in cool air and replace it with warm air at night. Convection cooling can be used even in windless areas by creating a thermal chimney. Thermal fireplaces are designed to allow hot air to rise. They create areas of hot or warm air (usually by capturing solar energy) and have high exits to the outside. Warm air leaves the building through the top vents and cool air is drawn in through the bottom vents. There are many different approaches to creating the thermal timny effect. One is a south facing porch with overhead ventilation. Air is drawn into the living space through the lower vents and expelled through the upper porch vents (enter the living space through the upper porch vents, close all available windows, and turn off the porch thermal blocks). walls must be shaded) (Littlefair, 1998).

2.6 Different attribute’s role in shaping santhal architecture

2.6.1 Relation of Culture and architecture

The historical disconnect with the architectural development of the elders' work has led to the production of indecipherable spaces. This unreadableness has become so bad that it can no longer be logically connected to the previous architecture. Persian architectural marvels appear to have been found elsewhere or constructed by foreigners so exotic that they are at odds with our contemporary architecture (JM Previtali, 2010). A nation's culture is represented by architecture, which is deeply rooted in all aspects of human life. The culture of a society influences architecture (Parvizi, 2011). Architecture should help someone establish their worth. Architecture is responsible for preserving within itself the ancient values of culture and is therefore seen as an element of the identity of the cultural realm, thus the homogeneity of culture and architecture found in the architectural world (Rahmtapnah, 2010).

Understand the relationship between culture and architecture. The first two things to mention are space and culture. Social structures exist both in space and in culture. It develops as people's sense of self is formed. Spaces play an important role, reinforcing cultural change based on expected patterns of behavior in a particular space. It reflects certain cultural values. This definition implies the construction of mental space. Beginning with concrete, physical space, the influence of mental space becomes apparent. It evokes a working composition of subjective and objective space in mixed continuous forms and architecture. In particular, it provides the relationship between local culture and architecture. Psychology explains the need for careful relationships between people and their artifacts. In this setting, culture is a factor or mode of human attitudes towards the artificial environment and falls into two categories.

a) standardized actions, thoughts and feelings

b) Products that are the result or continuation of the actions or thoughts of people in a particular society (Shayan, 2011)

2.6.2 Architecture as a symbol of the culture

Every society in which a system is managed and every ideology that governs it has its own goals and desires. The main function of the culture is to present a mental idea with something concrete in the application. Architecture plays a key role in this transformation process. According to Harman Motsios, architecture was the true measure of national culture. If a country can make beautiful furniture and chandeliers, but the worst buildings are being built every day, this means a dark and abnormal situation in society, where irregularities and a lack of power to organize the country prevail. (Geroter, 2007). In his work Architectural Aesthetics, Grotel examines every structure as part of architectural culture. Its role is to satisfy the spiritual opinion through its appearance so that it becomes a measure by which to judge culture. Below, he referred to Hans Hollein's definition of architecture. This is defined as the spiritual discipline embodied in buildings, so every building, whether conceptually good or bad, is a cultural testament.

2.6.3 Cultural factors affecting the formation of architectural spaces

Culture can influence the design of architectural spaces in two ways.

a) By creating behaviors and rules that lead to functional organizations Spatial hierarchy.
b) By creating memories, beliefs, and physical symptoms in the form of symbols prototypes and metaphors that lead to the creation of meaning in architectural space (Shayan, 2011).

2.6.4 Reflects of culture in the architectural spaces

There are several factors that influence the artistic and architectural spaces that are subsets of culture. For example, the church cross effect hierarchically separates different spaces, such as the components of the input space and the cultural content ideas that are buried in the early stages of the visitor's gaze. Otherwise, the impact is more subtle and less obvious. Some cultural features do not affect architecture in the same way as others. And some are easier to find, others more difficult. The importance of certain numbers and shapes increases from art to culture. One reason numbers are considered more is because of human perceptions of past

world orders. This was understood in its most concrete form, the order of numbers. Shapes and numbers were widely used in numerous events, artistic activities, schools of thought, etc. The application of numbers and forms in activity and art depended on the one hand on the numerical and visual properties of the activity and on the other hand on the features and characteristics of forms and figures. As a result, architectural art uses shapes and numbers such as 4, features of square and circle, circle and square, cube, volume of sphere, and common features such as four arcs. It was used and considered consistent with the characteristics of the country's mathematics, geometry, and less specific arts and cultures. (Diva, 1999)

2.6.5 Role of culture in promoting architectural identity

What is defined as a way of life is the most effective component of any network way of life. Culture has all the other components known as cloth components that denote buildings, factories, etc. In fact, these items are considered part of society's way of life. Because it is deeply rooted in values, beliefs, etc., and from here we see the hyperlink between ways of life and structures. Buildings are like books covered in dirt that you have to go and examine. In this way people's lifestyles and the societies in which they are built are identified (Parhizgar, 2003). The most important factor for the emergence of various architectural colleges is the turning point in life and creativity. All lifestyles and civilizations have evolved from the factors that stopped the ancients in crisis. But his way is to honor and extend the dictates of antiquity and history, and to reconstruct his structure with a few factors. Due to the direct influence of ways of life on structures, it is natural that cultural changes bring about a transformation of the appearance of structures into powerful principles and theories, resulting in unusual structures that determine the interplay between theoretical principles. thoughts arise. Fashionable Ways of Life and Techniques, Especially Theoretical Fundamentals and Structures (Diba, 1999). Every society has its own way of life, on which its structural foundation becomes established, and that structure is the goal image of that way of life. In fact, the structure evolved to a true degree of national way of life and remains today.The network way of life is responsible for the emerging sphere of approaches.

2.6.6 Relation of architecture and nature

Sustainability goals require new perspectives on the interaction of architecture and nature. Once valued primarily for their aesthetic qualities, natural ingredients are now the useful elements needed to increase energy, conserve water, and improve air quality.However, they retain their aesthetic value. I'm here. Natural elements play a new role in the design of settlements and public spaces, addressing a new unified perception of architecture and urban space. The search for a new type of relationship between architecture and nature began in the early 20th century. The utilitarian role of nature in literature and art was denied. As a result, the aesthetic appeal of natural components became important to architecture, serving as the backdrop for decoration, form, and composition. It finally emerged in his twentieth century, returning to its Vitruvian roots and becoming seen not as a whole in itself, but as a network of human-nature relationships. Modernist architecture seeks to reclaim nature on an aesthetic level, transforming the house into a living machine. The understanding of natural elements as

game pieces, designed to enhance the aesthetics of open landscapes and urban landscapes, is a hallmark of postmodernism. At the beginning of the 19th century, people began to look for the basics of how architecture and environment interact in contemporary human domain cultures. Contemporary architecture and public spaces use natural elements as building blocks. Natural components are no longer mere aesthetic additions to landscapes and architecture. They are now considered building materials for living environments. They are also used practically (Mazzoleni, 2013)

2.6.7 Relation of architecture and society

Human footprints in recent years, decades, or even centuries represent human existence and evolution in its history. These footprints contain a variety of evidence of human presence on Earth. One of his greatest types of evidence of human life in different parts of the world is its architecture. Architecture is a physical structure and has material value, but it was also an expression of culture, society, way of life and other abstract concepts of human life. We also recognize the rise and fall of different societies and civilizations. It describes the evolution of human lifestyles throughout human history. These influences demonstrate the importance of architecture to today's human societies, their lives, and the world. Before we begin, we need to understand the importance of architecture. The architecture of society is designed to provide people with all their basic needs and form communities. Hospitals, schools, universities, residential areas, markets, etc. All the basics for a decent life. Apart from that, society has gorgeous architecture that helps add an element of entertainment to the people.This includes cinemas, amusement parks, museums, restaurants, etc. Together they form a community. Good architecture and infrastructure reflect the success of social development. People have always been in awe of aesthetically pleasing architecture. The reason is that not only beauty attracts people, but amazing architecture shows modernity and social development (Viveiros, 1996).

2.7 Changing patterns in vernacular architecture

The phenomenon of change in indigenous settlements has been repeated many times. The concepts of change and continuation are continually being explored and questioned in colloquial language. The transformation of indigenous villages is a regular phenomenon. Modification of native language architecture involves several criteria such as: B. Domestic production, practices and livelihoods that lead to community displacement. New cultures and ways of life require the creation of new places. Changes in life patterns can directly affect native layout patterns. The emergence of new technologies such as electricity, communication equipment and consumer electronics is also driving change (Chuapram et al., 2012). Indigenous peoples' skills have always adapted to many changes and survived changes in environment and time, but the rate of change in the current situation is great and could lead to the extinction of languages.

2.7.1 Definition

Transformation is a natural phenomenon, which is a need-based response of the users arising out of various factors. As a result, the reasons for changing vernacular homes vary from location to area and from case to instance, more as a need-based reaction to the changing demands of the populace. For instance, due to the current generation leaving home in search of better economic possibilities, the joint family system has been supplanted by the nuclear family. When a result, as the family gets smaller, rituals and symbolic objectification become less important to the family order. The increasing requirement to use interior space at night for entertainment, television, and other purposes has changed how plans are laid up and how they work spatially. If an old house needs to be repaired, the transformation might only be partial; however, if a portion of the same structure needs to be built entirely new in the same location or annexed to the old house, the transformation might be whole. Plan, Walls, Openings, Roofing, Flooring, Columns / Beams (Structural supports), Moldings, and outdoor open areas like courtyard are all examples of where the aforementioned transformation can be seen.

2.7.2 Transformation: Theory and meaning

The fundamental characteristic of vernacular architecture, which was lost with the international and even intercontinental expansion of railways and commercial ships in the middle of the 19th century, is the use of regional construction materials. It is said to have enabled the movement of the. The lifespan of current conventional structures is matched by converted and converted materials, such as floor cement and concrete blocks, introduced in the modern construction industry or development projects. Presented in the new slang's emergency base. (Olive, 1997, from the Vernacular Architecture Encyclopedia) Vernacular architecture is said to as humanity's finest invention by Gombrich (2005). A lifestyle that was formerly promoted is fading away along with traditional structures. The relationship between the shape of the house and the culture is inseparable. As stated by (Amos., 1969). The culture and the shape of the house are intrinsically linked. The shape of the home is not merely the product of physical force or a single causative cause, but rather the widest of all social variables, according to Amos (1969). The outcome is. What makes an environment significant is how it was created to accommodate its inhabitants' requirements, not just as a storehouse of historical and cultural knowledge but also via alterations to the social, economic, and physical environment. It is a model that also demonstrates how well it has been used. You may learn more about how the native architecture of the interacts with societal and environmental changes by researching it. (Rubbo, 1979). "Design Gap" and "Cultural Invasion" expansion Vernacular architecture is important to research because of the "design gap" issue and the effects of "cultural invasion." It is being thought about. These two problems must be handled concurrently since they are related. The ethos of the design school itself is another element growing the distance between designers and clients (Susanroat, 2000). Formal education at the Design School serves as a means of assimilating architectural traditions and group identities in addition to educating novices to become proficient designers. Not only does the student's impression of the type of architecture alter as they get closer to graduating from the Design School, but they also develop more sophisticated design sensibility as a result of their intense study. It claims that the

intention to produce one practical design differs frequently from this. the desire to develop a great edifice. It's frequently thought of as obedient to necessity to build a setting designed to satisfy the wants of lower-tier clients. According to (Denyer, 1978), the architectural style is almost an integral component of the culture. Most African homes were built in circular forms and curved with round roof shapes and having conical or flat in shape. The description of architectural styles in Africa has suffered from interpretation, which is frequently considered to be more emotive than in meticulous style but as to Denyer under influence of foreign contacted there are gradually give way to transform their building forms to rectangular one. He was pointing out that the change and evolution from a prehistoric to a more developed state had saved such strong lobbying over the course of over 250 years. In his work, Denyer demonstrates how change processes may be either slow or abrupt, and how, in certain situations, despite political and economic changes, home décor has stayed mostly same. He stated that while there was a clear break with tradition in other areas of Ethiopia in the thirteenth century following the accession of the Solomonial dynasty, a pottery model of a house dating to the fifth century in Tigrie, Ethiopia, was discovered in 1959 and exhibits remarkable similarities with modern Tigrie houses. of the Solomonial dynasty when the stone-built capital was replaced by a tented camp arranged in concentric circle, which moved round the country.

2.7.3 Types of Transformation

Traditional knowledge and the use of local resources are crucial to vernacular construction. It is not just about the natural environment; it is also about the social and cultural values of the area. A community's cultural domain, which expresses everyday activities and belief in the cultural order and system, is reflected in the geographical layout and design. The form of building is determined by the accessibility of transportation (road connection), the income of the populace, the accessibility of building supplies, and the perceptions and traditions of the person or community. Based on the changes or introduction of new materials, construction technologies, policies, changes in the social structure, microclimatic conditions, and economic status that have been seen in various regions, the literature claims that the transformations seen today can be divided into three stages. Transformations have taken place in various levels, from partial to total. Buildings that have undergone partial transformation or are in the middle stage of transformation can be identified by changes in material or construction method as well as modifications to the spatial arrangement. Urban and rural settings experience various stages of transformation. The demise of native or vernacular architecture is a result of the quicker rate of change in metropolitan areas as modernization and infrastructure development go more quickly. In rural regions, where transition is still occurring at a slow pace, traditional architecture and a few intermediate-stage structures coexist with modern construction.

The type or extent of modifications in vernacular architecture can be categorized in a number of different ways. Among them is:

One of them is:

a. Normative transformation or traditional vernacular structures
b. Partially/hybrid transformation or intermediate vernacular constructions
c. Total Transformation

2.7.3.1 Normative Transformations:

Vernacular practices differ in many ways, frequently based on the social and cultural norms of a location. Visual representations of variations in a settlement's social or economic values can be discovered in the quantity and type of architectural variability found in a given area. Residents construct a parallel design or detail pattern in the shifting setting to accommodate these variations. A "normative" change occurs when unique features are adopted by all homes or architectural places (Weldekidan, 2015). Homes or buildings that exhibit the vernacular style are commonly referred to as "old homes" or "old structures." In the study of transformations, houses with minimal or no alterations have been labeled as "ancient" or "vernacular constructions" (Kotharkar & Deshpande).

2.7.3.2 Partially/Hybrid Transformations:

People in a colony have had the opportunity to create the present infrastructure to meet their demands due to the ease of access to various sources of materials and labor (skilled/unskilled). These changes might be physical or include a shift in spatial layout. When the changes are noticeable but not permanent. Because it preserves the bulk of the indigenous styles, it is characterized as partial or hybrid metamorphosis. This sort of adjustment is commonly allowed since, in certain cases, these modifications are required. It is necessary to reduce the burden on the built structure's operation and maintenance ((Weldekidan, 2015) Current transitions that are neither totally vernacular nor entirely new, but fall into the intermediate or partial/hybrid category. Modifications are made to vernacular architecture.

For the University of Bahrain's School of Architecture (Ranjith Dayaratne), certain architectural forms oscillating between tradition and modernity can often only be described as 'hybrids' with natural features. Local and modern, or sometimes even belonging to need. Despite the interesting dichotomy that exists and is often misunderstood and misrepresented, it is undeniable that local settlements and architecture exhibit remarkable resilience, adaptability and innovation. They must be accepted as professionals. Architects and planners cannot participate in the site creation process. Unless they understand the nature of the institutions they must operate, they build cultures, live, create, build forms and places. From large-scale developments to his one-off mega-his projects, the interconnectedness and mutual influence of spoken and modern languages cannot be overlooked. Emerging hybrid connections need to be mapped, theorized and clarified to underscore the ongoing metamorphosis of modern settlements and their architecture.

2.7.3.3 Total Transformation:

Rapid changes in built environments have resulted in progressive changes in the built environment as a result of industrialisation and urbanization. Form, material, spatial planning, and construction are all transformed. Total transformations are techniques that are impacted by present and global forces. These makeovers are typically created and inspired by residents of a neighboring developed metropolis or metropolitan region, and they are the result of trained labor (Weldekidan, 2015). Certain conventional methods that are problematic in the field of

totally renovated homes, according to (Catherine R. Ettinger, 2008), include: The typical home contains a few spacious rooms that are linked together by covered passageways. These rooms are easily adaptable to varied applications and frequently vary seasonally, whereas the "modern" house has a fragmented spatial layout with limited flexibility in use due to reduced size. One of the most significant changes brought about by the replacement of the conventional house is the construction of a clear divide between indoor and outdoor space. A front door replaces the usual threshold. Transitional areas between interior and outdoor space, as well as between the public and private realms, vanish, and the shift is sudden.

a) The use of outdoor space

Traditional homes have many large rooms separated by covered walkways. While these spaces are easily adaptable to different uses and often change from season to season, the "modern" house is segmented with the smaller dimensions and the less flexible to use. It has a space scheme. One of the biggest changes to replace traditional homes is the establishment of the, which clearly distinguishes between indoor and outdoor spaces. The traditional threshold has been replaced by the front door. The migration space between the indoor and outdoor spaces and the public and private areas disappears and the migration happens suddenly.

b) Food preparation

In a traditional household, the kitchen is a personal room that belongs to the housekeeper where traditional indoor food preparation takes place. The kitchen structure is an insulating element made of either clay or burned. In other places, he was so intimately tied to the lady he belonged to that the family would construct a new kitchen after his passing rather than use the one they had before. This explains why it is not unexpected that many communities have rejected the new, modern kitchen with its equipment, such as the gas burner. The traditional building in the rear is still in use, despite the fact that they are a part of the home and displayed to guests as examples of modernism.

c) Storage

Contradictions arise from establishing an urban residence in a rural setting. Grain and agricultural equipment can be kept in the traditional house's granary and passageways. Improvisation is required due to the absence of these areas in the new house. It was typical to discover second-floor chambers used to store dried corn to make a year's worth of tortillas since grain was typically stored above the home. The concept of a closet is alien in new homes; therefore, nails are driven into the wall to hang clothing the conventional way.

d) Notions of privacy and the public realm

In the same way that the new geographical distribution imposes new uses, the traditional spatial distribution reflects social practices, beliefs, and norms of interaction among various community members. Males only enter the kitchen during mealtimes, and women are rarely

there when men get together to discuss. When males are present in the living area of a home where the living and dining rooms are open and connected to the stairs, wives and daughters are essentially imprisoned on the second story. Guests often do not enter the internal area of the traditional home because of the spatial arrangement that allowed different members of the extended family to roam about the compound. The addition of separate sleeping areas for youngsters is another change brought about by the new spatial arrangement. One guy shares his perspective on privacy after working as a migrant worker: "In villages, individuals often sleep together in one room or in a hallway. Lang, but those who have had the chance to cross over or go to school should set aside one room for their son and another for their daughter".

e) House as Representation

In the scenario given, adopting a new house shape entails sacrifice on the part of the owners as well as a readiness to adapt and change in order to live in the current world. The house's role as a symbol of the ego, of the relationship between the self and the community, and of personal accomplishment provides an explanation for this sacrifice. Following Amos Rapoport's more recent version, Meaning is sometimes the most crucial function of a house, not just a component of it. The new house sticks out in the neighborhood of traditional homes. The two-story brick and concrete building disrupt the flow of the adobe or stone walls, and discordant oranges, blues, and greens emerge within the natural color scheme. One of the most obvious indications of a significant shift in the sense of community is the use of the house as a platform for displaying uniqueness, success, or just difference (Weldekidan, 2015).

2.7.3.4 Factors for transformation of vernacular architecture

a) Urbanization and Globalization

According to (Ranjith Dayaratne), the native and traditional built environment has been significantly impacted by fast growth, urbanization, and globalization in the 20th century. There is no denying that all facets of society have undergone quick and sudden change in place of the gradual development inherent in these contexts. Major plans and projects, many rural-urban migrations, the information revolution, improved transportation, contemporary construction technology, and shifting values and attitudes have all been cited as the primary drivers of this development. The transformations of the built environment, including changes in spatial expression, material adaptations, mutations, expansions, symbolic gestures, and frequently ostentatious construction forms, are proof that the close connections between the built environment and the cultural values of the people who built and inhabited it have been broken. However, a sizable fraction of the native and traditional traits has persisted, changed in a variety of ways, and adapted to the shift despite the enormous rise in urban population and contemporary settlements (Weldekidan, 2015).

b) Materials, construction, and technology

Materials, construction, and technology are better considered as moderating factors than form determinants since they do not decide the building of the home or its shape; rather, these decisions are taken on the basis of other considerations. They enable the containment of a space organization chosen for various reasons, as well as the modification of that organization. They facilitate and make certain decisions feasible or impossible, but they never decide or define shape. (Ayp, 1954). Space must be contained in order to construct any form of area. In an architectural setting, the availability and selection of materials and construction processes will considerably affect and change the design of the structure. The reason why construction (which, of course, involves technology) and materials are best regarded is modifying factors, in spite of their fundamental nature, is that they do not determine form. They merely render forms that have been chosen on other criteria feasible, they render some forms impossible, and through serving as a tool, they modify forms. One of the basic problems of architecture, and the principal problem of construction, is the spanning of space-the collection of gravitational forces and their transmission to the ground, usually requiring materials having reasonable tensile strength and a reasonable weight-strength ratio. In primitive time, these are limited to organic materials either animal in origin (bone, skin, and felts) or vegetable (timber or plaited, woven, or twisted vegetable fibers in such forms as matting, textiles, and rope). In prehistoric times, they were confined to organic materials that were either animal-derived (bone, skin, and felts) or vegetable-derived (timber or plaited, woven, or twisted vegetable fibers in such forms as matting, textiles, and rope). The sole change to the preindustrial vernacular is a tiny amount of metal every now and again. Special kinds of building, such as beehive vaults and domes, genuine vaults and domes, have been designed if such materials are not accessible or are difficult to get. In certain circumstances, the necessity for tensile strength has necessitated transporting lumber across long distances. Because of their rarity, the beams have been employed full-length, causing parts to protrude; these beams have been removed and reused several times (Weldekidan, 2015).

c) Other Factors

One of the most distinguishing qualities of vernacular architecture is that it does not entirely conform to the predefined standards. It is a 'additive' and 'evolutionary' architecture influenced by a variety of elements such as the occupants' economic position, family development, the unexpected requirement for a new function, and so on. Today, the restoration process is motivated not just by the need for greater space, but also by a desire to preserve and renew the past (Levant, 2004). According to the writer, the flat earth roofs of Mount Lebanon communities are being replaced with imported red tiles on pitched roofs in a relatively short period of time. The rural house's development reflects the village's transition, from an almost barren and modest single area to a residence full of European style furnishings and contemporary appliances. The hamlet, which was an essentially self-sufficient agglomeration where life revolved - and was focused - around: land, kinship, and religion, was turned into a suburb in a few decades. Gulick (1955) It now revolved around the Western world, especially following the state's consolidation and independence in 1943. In 1920, new building materials

are introduced (particularly concrete by the 1930s), and new influences (colonialism and modernism) become prominent. Naturally, this new vocabulary is used to build vernacular expansions. With the increased usage of concrete came a drop in the number of artisans who passed down their knowledge for centuries. To save maintenance, many flat compacted earth roofs were rebuilt with reinforced concrete; stone lintels were replaced with concrete lintels that are more efficient in tension. Many residences also gained larger concrete terraces and balconies; concrete was not employed only for its physical properties, but gradually began to replace older construction processes.

2.7.3.5 Consequences of Transformation

A stance of total relativism is prone to result from giving so much attention to the culturally related components of the built form, according to Sigfried Giedion in 1962 and 1964. When a certain culture or way of life evolves, its shape loses all significance. While housing and payment structures have undergone substantial meaning shifts, many artifacts continue to be useful long after the civilization that produced them has vanished. We are aware. In actuality, as opposed to using technical terminology, such forms frequently outperform humans. For instance, compared to American homes, Mexican homes and the settlement pattern they belong to are in many respects superior, while European medieval cities are more pleasant and perceptive than contemporary towns. This implies that some facets of behavior and way of life are stable or change extremely slowly, and that outdated substitutes are frequently absent or insufficient. The value of the prestige of the innovation, not a relationship, is what matters. about living. Similarly, it goes without saying that adoption of outdated forms may come from their reputation rather than from their continued applicability or validity. Both situations include culturally similar views toward antiquated forms, but there seem to be aspects of homeostasis that warrant additional study or are at least plausible. The question of the created form, the biological nature of human beings, both the aspects of homeostasis and change that may be seen in relation to his cognition and conduct are all tied to the nature of people and his institution. It is recommended that this be included. The distinction between constant and changing elements can have important consequences for houses and towns. Some French urban sociologists' distinctions between different sorts of urban spaces can be somewhat understood in these terms, however architects can distinguish between technical spaces and techniques such as toilets and utility spaces. It implies that the space may be easily separated. Facilities and services are constantly changing, symbolic, and primarily inhabited areas that may be utilized eternally. This latter sort of space is associated with territorial consciousness and defines the concepts of "ethnic domain," space separation in a home or tent, and domain separation. The idea of place and the concept of ethnic territory are fundamental. There are several definitions of place. The location of one individual may differ from the location of another, and the notion of a happy life, and therefore its framework, may differ as well. Change aspects are prominent to varied degrees, since what is done in might be more significant than what is done, but this does not exclude persistence, as is commonly assumed (Weldekidan, 2015).

2.8 Characteristics of Santhal architecture

2.9 Background

Figure 2: santhal settlement

Santhal.com

The Government of Nepal has identified 59 indigenous nationalities through the enactment National Indigenous Peoples Development Act 2002. The Indigenous Peoples Act 2002, Adivasi / Janajati are communities that "have native language and traditional culture but not belonging to ordinary Hinduism hierarchical caste structure". Adivasi/Janjati are thus defined as having a collective identity that includes their own language, religion, tradition, culture, and civilization, as well as their own homeland or geographic region and written or oral history. They still have had not played a decisive role in politics and government in modern Nepal (NEFIN, 2004). NEFIN (2004) further categorize 59 Adivasi/Janajatis into five groups including endangered species, high disadvantaged, advanced groups. Out of 59 indigenous communities, the Santhals are classified as the most marginalized group indigenous peoples living in the southeastern region of Nepal.

Santhal people are mainly found in the districts of Terai region, i.e., Jhapa, Morang, Sunsari. The word "Santal" is derived from two words; santa means calm and peace and ala mean man. They first settled in Jhapa and Morang district by clearing charkose Jhadi (Sharma, 2011). Based on in the 2011 National Population and Housing Census (NPCS) the total population of Santhal in Nepal is 51,735. 1736 people live in Santhal's urban area, compared to 49,999 people in its rural areas (NPCS, 2012). Most of the population of Santhal is found in Jhapa and Morang districts in Nepal, home to 92.64% of the population of Santhal. As a large part of the Santhals live in the rural areas of the Jhapa and Morang districts, occupation is agriculture. They cultivate the land. Most of them cultivate the land of the Landlord or under the contract and divide half of the production with owners. The land reform program of 1967 did not benefit them (Bose, 2012). The land reform law abolished all communal lands and converted them into private property or national land, resulting in loss of land to the indigenous poor. They speak Santali in the Munda group of the Austroasiatic language subfamily. Santali has its own script called "Ol chiki" coined by Pundit Raghunath Murm. Santal's situation made worse by political repression and economic exploitation of brahmin/chhetri, the so-called high caste of Nepal. The people of the hill (brahmin / chhetri) deceive and take over Santhal land and force them to live a miserable life (murmu, 2012)

2.10 History

Figure 3: Santhal dwelling with thatch roof

Santhal.com

The history of permanent settlement is related to the myth of Santal's origin. From their origin myth, they are descendants of Pilchuharam (male of Santal's first ancestor) and Pilchubudi (female of Santal's first ancestor). Pilchuharam and Pilchubudi lived in a jungle cave (Dandall). Then, according to God's advice, they got married and eventually got seven boys (Kora) and eight girls (Kuri), and then Pilchuharam taught them hunting, collecting food from the jungle, and making bows and arrows for hunting. Pilchubudi recently did household chores with his daughters in. Pilchuharam flute made for delight. One day, as boys and girls were growing up, entered the jungle, and when they returned, they saw the sisters making noise and swaying on a banyan tree branch. The boys approached their sisters. The brothers and sisters get married. His eldest daughter, remained unmarried. Each son was given the title of his clan (Paris), and each son was assigned several tasks to be performed in the future. Also, in, after marriage, the woman acquired the name of her husband's clan, and it was decided that clan would be an exogamy for marriage. That is, a boy of clan "A" cannot marry a girl of the same clan, but a girl of clan `B`, ` C` or `D`. The seven clan names given to the seven boys are Murmu, Kisk, Hembrom, Solen, Mardi, Tudu, and Hansuda. Murmu was given the duty of Ojha Guru / Jan Guru / Guruharam; Kisku became king (Murmu, 2014).

Hembrom became priest. Mardi became a village watchman. Tudu became Kudam Neke, he had to devote his blood to worship, and Hansuda became a helper for Jogmanji. After marriage, they eventually became parents of several children, and in the population began to grow and they had to build a house. Because it was not easy to live them them all in a dandall (cave). Then, the primitive house Kumbaolac a hut made of wooden sticks and fan palm or date palm leaves was first built. Then one day, Pilchuharam and Pilchubudi expired. They burned and carried the umbilical cord to the banks of the Damodar River. The place taken in is called the Damodor Pool. After that, it became the one of center of Santal's pilgrimage. Santal then carried out their mission and the norms according to the instructions of Pilchuharam and Pilchuvdi. However, the breach of some social norms in by some of them began the establishment of the other five clans. Besra, Baske, Paulia, Core, Bedea. As a result, their numbers increase and are unable to stay in the forest due to lack of food and shelter. Then they decide to clear the jungle, create a flat land or clearing, and build a house there. After that, the Yang Guru all worshiped Bongas and prayed for a peaceful life in the new colony. Then Jhenti Orak and Kumbha Orak are prepared for temporary residence made of a stick of wood and palm or date palm leaves. And finally, they prepare mud huts (Hasaorak) for permanent settlement. After that, all the spirits are worshiped and settled in the village. Festival (Parab) was created for better housing, At Sohrae, ancestral spirits and bongas are worshiped through performances of various rituals, sacrifices, and rituals. Then they started growing and domesticated animals such as poultry,

ducks, pigeons, cattle, cattle, calves, buffalo, sheep, goats, pigs and dogs. When domestication of livestock began in, they prepared a breeding ground for these animals and birds ie. Gora, Gudori, Tangi, Kundi, etc. Santal began decorating the walls of his house by keeping his rooms, houses, streets and villages clean and painting life events.

From above mentioned story it is clear, that they had to cross several steps before forming a permanent settlement, as well as there is a clear development sequence to shape a mud-built hut after other forms of hut. The story of genesis is transmitted over generations through oral traditions and therefore it is possible that changes took place both in form and narration of the story from place to place and time to time (Murmu, 2014).

2.11 Indigenous people

Santhal community is the groups of indigenous people. Indigenous peoples are separate social and cultural groups that have a historical affinity for the lands and natural resources they have either occupied or been displaced from. Their identity, culture, way of life, physical and mental health, and reliance on the land and its natural resources are all intertwined. They frequently follow their customary groups and leaders to signify their distinctions from or isolation from the prevailing society or culture. Many indigenous peoples continue to speak a language that is different from the official language of the nation or area where they live. Thus, indigenous group consist of own architecture which represent their architecture which is called as vernacular architecture. Vernacular architecture. Our forefathers gave us a magnificent gift in the form of traditional architecture. It was developed for many centuries without built many serious environments and health in the issue (Rijal, 2018). A traditional -year-old housing building is a cooler at least 1 to 2 times in summer compared to the modern housing building in the Kathmandu Valley (Bajracharya, 2014). Nepal is a small nation with a varied climate that ranges from subtropical to freezing due to altitude differences. Thus, thus can find various types of traditional furniture using different routes to reduce the thermal state of interior. Some examples are the use of eaves or roofs to reduce sunlight, the design of effective ventilators, the creation of semi-open spaces, and increasing thermal mass by use of stone and mud.

Figure 4: Santhali people

source: santhal.com

2.11.1 House and settlement

Santal is bordered by farms, pastures, ponds, graveyards, and communal places of worship known as Jaher Era, or Jaher for short. Jaher is a holy grove of sal trees on the borders of the hamlet. It is thought that their gods reside there. Santar village homes typically range from 20 to 40. Their residence is encircled by a border and is laid out in linear patterns on both sides of a huge village street (murmu, 2012). The Pangrigala of the barn is just close to the home. There is a vegetable field behind the home. The residence features a rectangular courtyard where

residents may gather in their spare time to talk about various topics. Manjhi, the secular village mayor, has the largest mansion in the area.In his house there is another ritual site called Manjisan. It's the seat of the founding spirit chief of the village.

2.11.2 Livelihood

Primary occupation Santal works in agriculture. Men and women are both active in this pursuit. They gather minor forest goods including roots, fruits, tubers, green leaves, yams, honey, and so on. Keep them for 3-4 months (Bhattarai, 2015). In addition, they gather firewood, medicinal plants, grass, and bamboo. Build a house, farm, hunt, manufacture fishing equipment, cook, heal illnesses, and so on. The lady prepares the leaves and cup from the Sal tree and makes a broom from the grass to sell at the local market to supplement their income. The Santal may occasionally hunt birds and rats for meals. They also used to drive various automobiles and work as carpenters who specialized in furniture. This talent also allows them to augment their income.

2.11.3 Religion and culture

Religion (dharma) is seen as an integral aspect of Santal existence. Though they are essentially animists, due of their recent cultural revivalism, they have termed their religion sarna after the popular name of their village's "holy grove." The Santals, like other tribals, are polytheists. They believe in a variety of deities, ghosts, and spirits who live in the hills, forests, and streams, as well as ancestral spirits who guide every part of their lives. The beneficent ultimate deity among them is Dharam or Thakur or Sing Bonga, who is connected with the sun and adored by many people as the creator of the cosmos. Although no special ceremony or celebration is celebrated in his honor, he is honored and venerated at all key festivals. Their local deities are Marang Buru, Moneko-Turiko, and Gosane Era, who reside in the hamlet's holy forest - jahera - on the periphery. These gods play a crucial part in Santhal's everyday existence. Another prominent god in the hamlet is Manjhi Haram Bongathe, the community's founder, who lives inside the village in the front manjhi, the village chief's residence. Every morning, the chief of the community worships the deity. At the family level, they worship their family deity and ancestor spirits, Hapram Bonga and Abge Bonga, at a holy area called the altar in each house. They also worship natural gods such as Buru Bonga (gods of the hills), Rango Bonga (gods of the forest), and Basumata (mother earth). They began worshiping some local Hindu gods and goddesses today. The Santals, like other tribal cultures, believe in witchcraft and black magic. Surnames think that witches or deans are human beings who become such by acquiring the Vidya (magic skill) and have the wicked power to hurt people and produce misfortune. Santhal is terrified of witches. Naike is the local priest and religious leader who is backed by Kudam Naike. The shaman, Ojha, is a traditional magical religious healer. He has the ability to communicate with spirits beyond pleasure.

The Santals have a variety of festivals throughout the year to honor their Gods and Goddesses. Because the Santals are farmers, their holidays are largely associated with various agricultural occupations, but some also entail collecting and hunting for food in the forest.

2.11.4 Festival

Sorhae is the biggest Santal festival. The Santals of all the locality celebrate this festival with various rituals, songs and dances at the end of the month of kartik. This festival was held in Kalipuja in the month of Ashwin-Karthik (ie from mid-September to mid-November). Depending on the geographical conditions of the area, the farming schedule varies - rice is harvested in the month of Ashwin, after which holidays are celebrated. The name "Sorhae" comes from the root "Sarhao," which denotes Thanksgiving. During this festival, thanksgiving is given to the good spirits of the family and village who provide the food they need to keep them healthy throughout the year. The first day of the celebration is called "Um Hilok", which means bathing day. All the villagers clean their houses to prepare for the festival. With the guidance of manjhi haram, the village chief, the shoal, and the village messenger, together with the children collected a quarter kilogram of rice, a handful of beans, 4-5 potatoes, cooking oil, salt, cold, firewood. and a chicken from each family in the village. A got-tandi altar, built outside the village in the field. There, the village sorcerer and shaman sacrifice these chicks to commemorate the spirits of the ancestors and the spirits of the village. After the sacrifice, all those people gathered, made a truss of legumes, and went there. In the evening, the village priest, while holding an egg in the field, asked the cowherds to pass their herd over to this egg. The owner of the cow who touches the egg with his foot will provide an earthen pot to make rice beer during the next festival of the month of Magh. Touching the egg with the hooves is considered auspicious for the family. After that, everyone entered the village to play drums behind the village priest.

The second day is Bongan Hilok, a day to mentally train yourself in good spirits. Family members spent most of their time together. The head of the family fasted in the morning and served the family's spirits with the best rice beer. Then he shared rice beer with family members and then with neighbors. Meat, fish - a delicacy prepared in every family. In the evening, songs and dances begin.

The third day is Khuntao. Itis a special day for pets. People clean plows, spades, weeds, axes, sickles, etc. on that morning. with water and oiled them, and kept them in patches in the yard. The buffaloes are also cleaned of grease, tied to stakes on either side of the village road. They were crowned with sweet rice flowers around their horns and necks, and people sang and danced in their honor. Wednesday is Jaley, which means strengthening relationships. All villagers continue to dance and sing together in the streets of the village. Singing and dancing, if entering a family's house, they will be carried with rice and wine. Together dancing and singing erases all forms of suffocation and misunderstanding between friends and neighbors. Generally, a day is set aside for rest after the fourth day of celebration. It is called Haku-Katkom, which means fish and crab tasting day.

The last day is Sakrat day. The spirits are worshiped and brought back to the village on the first day, which is the day to keep them in their respective places. In the morning, the priest leads the male members into the forest to hunt. Returning in the evening, all gathered in the field near the village. There, the village priest's wife tied three breads made of rice flour to a banana tree, and these were shot from a distance with arrows. It means, if an evil spirit enters the village, will be threatened and banished in this way. The pole is then cut into several pieces

and the cake cutter will first carry them on his shoulder and so he will climb onto the shoulder of a bachelor to enter the village. Meanwhile, the children in the village show off their acrobatic skills, virtuosity, then everyone goes to the village chief, shaman and other elected officials while singing; and after drinking beer, they go back to their house.

Another interpretation of the root word Sorhae: Pilchu Haram and Pilchu Budhi, the first man and the first woman to have eight daughters and seven sons. One day when the boys went to the Khanderae forest to hunt and the girls went to the Surukuc forest to pick vegetables, they were physically attracted while playing under the banyan tree and fell in love with husband and wife. Sister pairs with brother and sister with brother and so on. In the end, the eldest sister named Sorhae had no one to associate with, so they decided to build her a house and promised to invite her to their house every year after the harvest and a holiday with them. Until now, before the start of the festival, married girls are invited to perform Sorhae at their parents' house with their loved ones. Even now, people still use the phrase "marang dai e seteroh kana," which means "eldest sister is coming," when Sorhai is arriving (murmu, 2012).

2.11.5 Arts and crafts

The Santals are naturally adept in the arts and crafts, as seen by their stunning murals, house construction, and furnishings. Their doors are adorned with vibrant decorations. Interior walls are also adorned with lovely drawings of Santal ladies. They maintain the house nice and clean, as well as decorate, in order to placate the gods and goddesses and obtain their benefits.

1999 (SK Varma). Dance (Enej) and music (sereng), as in other tribes, are an important element of Santa's existence. They dance and sing when they are in a good mood, as though they enjoy it, and these are usually related with festivals and rituals, which are always the community's business. The celebration is attended by sons and daughters, young and old, regardless of age or gender. Visits to dance are made between communities. There are no hard and fast restrictions about the timing and location of the dance. However, they frequently dance at night. The dancers don't use any special outfits. Various dances such as the Kalasi dance, Danta dance, Rinja dance, Baha dance, Jachur dance, and others are performed at various celebrations. Santas have a variety of songs for the occasion. During religious events, devotional songs are sung. The Santal dance is traditionally done with thumping air drums and the breath of the flute. While dancing, instruments such as tamak, dhol, bhuang, tumdah, tiriau banam (a string violin), ghanta (iron bell), and singa (horned trumpet), sarangi are utilized (SK Varma, 1999).

2.11.6 Social life

Santhal prioritizes communal life over individual existence. The Santals have a well-developed political structure. It works on a local, inter-local, and national scale. The village is the smallest and most significant entity on the ground level. The family is the Santals' smallest social group. It is patrilocal, patrilineal, and patriarchal in character. Father is the family's head, and he oversees the whole family business. Following the wedding, the son lives apart from his father and establishes a tent. The girl travels to her husband's place after the wedding. Although the family structure is usually core, extended family members such as parents and their son and grandchild may be married. The government of the santhal community has founded a separate community (murmu, 2012).

2.11.6.1 Family

Among the Santals, the family is the smallest social unit. That is patriarchal, patriarchal, and patriarchal. The father is the head of the family and manages the entire family business. After the wedding, the son lives far away from his father and sets up a tent. After the wedding, the girl went to get married. Although the family structure is sometimes still nuclear, the extended family, consisting of parents and their sons and grandchildren, is married. Family relationships are divided into two categories: bandhupela, or blood ties, and kutumpela, or marriage ties. Two groups of parents participate in all socio-religious functions of the family. The tribes were divided into a number of strange clans, known as bettors. Each clan was divided into sub-gens (khut). marriage between subordinates is strictly prohibited. Violation of the rules can be punished. Social communication is called bitlaha. Totem cult is also present. Sex between family members is taboo (Murmu, 2012).

2.11.6.2 Pregnancy and child birth

The birth of a child always makes Santal and his wife happy. There are taboos and restrictions in Santal that pregnant women must follow. The husband of a pregnant woman is not allowed to kill or raise animals during each burial, not to touch the corpse, and not to let the pregnant woman in or out. She goes alone into the forest to mourn the deaths of her loved ones. Pregnant women will do just about anything, except for the hard work, the simple kind of work. These limits are imposed only to protect the baby from evil spirits. Traditional midwives called "Mukhi" give birth to a child. After giving birth, she cut off her umbilical cord and placed the placenta in the right hollow in the corner of the door in the same room (SK Varma, 1999).

2.11.6.3 Janam chhatiar

The mother, considered a ritually impure person, remained isolated in the rest room until Janam Chhatiar, where purification rituals were performed. During this time, she is not allowed to enter the kitchen or touch anyone. The ceremony takes place on the seventh or ninth day of the birth. On this day, midwives bathe babies and mothers. All family members have a clean shower, clean clothes and clean house and get rid of the used clay pots. The ritual ends after cleaning with soil obtained from the cultivated fields. On the same day, the baptism took place.

On this occasion, the midwife accepts the child and with the consent of all family members, the name of the deceased ancestor is chosen according to the paternal or maternal side of the newborn. All the elders were present to bless the child. They entertain themselves with festive meals and drinks (SK Varma, 1999).

2.11.6.4 Marriage (Bapla)

The wedding ceremony (bhapra) is one of the most important events in Santal society. This makes the individual a full member of the community. Financially speaking, a man who finds a partner can help him in all financial activities. Certain rules and customs apply to marriage. Marriage within the same clan and marriage between first cousins is prohibited. There is no age limit for getting married in Santal. The bride can be younger, older, or the same age as the groom. B. Marriage by negotiation (sangebariyat), marriage by agreement, marriage by arrest (ipitut bapla), marriage by plane (gurdaonapam), widow remarriage (sanga bapla), son-in-law (ghar- de-jamai), a Hindu marriage style (diku bapla) common in santal societies. Arranged marriage (sangebariyat) is a common practice in the Santal community. Their society also allows Levilate and Sololate marriages. Marriage negotiations are first initiated by the groom's family. The elders of both sides exchanged several visits to set customary dowries. The bride price is paid by the man in cash and in kind and includes a few rupees, an ox/cow and three sarees (one for the bride's mother, one for the father's grandmother and one for the father's sister). The date for the wedding has been decided. On the day of the wedding, the bride throws a party at the groom's house where the wedding takes place. Marriage costs vary greatly depending on the type of marriage. Marriage is a community responsibility, with its members and neighboring villages participating. Parents of boys and girls and village leaders play a very important role in this case (SK Varma, 1999).

2.11.6.5 Divorce

Divorce is a continuation of the popular Santal marriage. Granted at the will of the spouse. If the wife turns out to be a witch, does not listen to her wife, or always goes to her father's house, her husband can file for divorce. If the husband cannot provide enough food, clothing, etc., the wife can ask for a divorce. If a woman divorces her husband in order to remarry another man, the husband must return the marriage expenses and other expenses to the ex-husband, and if the husband divorces the wife, the local government stipulates I have to pay compensation to my wife. Council (SK Varma, 1999).

2.11.6.6 Death Rites

In Santal society, after death, family members are invited to be buried. After returning from the cemetery, they burn straw and smoke dip at the town entrance. Funeral workers of the dead carry away nothing but plants in times of deadly pollution.The Santal believe that the spirits of the dead can stay in their homes and harm their families and villagers until the death rituals are performed. The cleansing rites of death will take place within 2/3 days, so they hastened to hold the funeral as soon as possible. Burial and cremation are common in their society. The

bones of the deceased are collected and placed in a clay pot and left in a tree pit. Before the Makar festival, the bones are soaked in a river called Damodar Jatra. Today the bones of the deceased are buried in the river associated with the site (SK Varma, 1999).

2.11.7 Community Activities:

Originally, Santals relied mostly on hunting for livelihood. People shared a balanced sense of community, and the entire group felt like an extended family with a symbolic link. Individual units grew increasingly self-sufficient as agriculture and migration to other regions became more common. However, the sense of community continues to unite them in a harmonious and interdependent social framework (Bhattarai, 2015).

2.11.8 Administrative Hierarchy:

A village is governed by a group of high-ranking members, each assigned a specific role. These members are Maji, Paranik, Jog Maji, Jog Paranik, Nayake, Kudam Nayake and Godes. These governing bodies have different roles and responsibilities to the community as a whole. Briefly their roles are shown below (murmu, 2012):

a) Majhi- The village headman. Any small and legal problems, important village functions and administrative activities are managed by them.
b) Paranik- Assistant to the Majhi. Acts in his absence.
c) Jog Majhi- Takes up responsibility for the customs and conduct of the youth of the village.
d) Jog Paranik- Assistant to Jog Majhi.
e) Nayake- Priest of the village.
f) Kudam Nayake- Assistant priest wards off evil spiritsGodeth- Messenger of the Majhi. Arranges meetings and ceremonial get together among several villages.
g) Godeth- Messenger of the Majhi. Arranges meetings and ceremonial get together among several villages.

2.11.9 Food and drinks

Their primary meal is rice. Typical meals for them include water rice, boiled vegetables, and vegetable curries. They consume produce such as tomatoes, sweet potatoes, papayas, pumpkins, and brinjal. They make and bring away rice cakes and lamb or chicken curries during rituals and festivities. They enjoy eating seafood. Santals residents like drinking rice beer (Bhattarai, 2015).

2.11.10 Dress and ornaments

Traditional clothing and personality. Santhal's particular adoration sets them apart from other societies. Men wear hand-woven loincloths (kacha), balustrade, shirt and towel (gamchha), and women wear green or blue check sarees. However, they now wear factory-made attire. Santhal ladies like wearing jewels such as pankatha (hairpins), sikimala (piece necklaces), bracelets, and Painri (ankle ring). They used to wear heavy silver jewelry, but now, as a result of

modernisation, the younger generation chooses to wear plastic, glass, and mild silver decorations. Tattoos were once considered an outmoded custom (Bhattarai, 2015).

2.11.11 Household articles

Household items such as string beds, peeling levers (ukhud), wind fans (hatah), gourd trowels, and earthenware Bowl (furutsukuji), bamboo basket (tunki), rice bin (bandi), broom (janna), etc.

Types of instruments such as flute (tiriau), horn trumpet (saqua), strings (banum), double Membrane Drums - Agricultural implements such as tumdas, ducks, plows (nahel), yokes (alans) and levelers (angam), sickles (datram), hunting tools such as bows (ah) and arrows (sa), spears (Balti),sacrificial, animals also fishing tools such as axes (kapi), knives (chak), jimiri, tardan, janji, and dhokla.

2.11.12 Haat and weekly market

The local weekly market, or haat, plays a significant role in the socioeconomic lives of the Santhal people. This is where people barter for essentials or sell surplus agricultural and forest goods. It is also a gathering area where individuals, friends, and relatives from many villages gather to exchange feelings and interact (SK Varma, 1999).

2.11.13 Change and Development

Nowadays, the Santals are regarded as one of the most developed communities. Urbanization, industrialization, and regular encounters with Hindu castes have significantly altered their way of life. Many Santal youths are increasingly migrating to towns and cities in search of better education and employment prospects. Occupational mobility has also resulted in a significant shift in their lifestyle. Since independence, the government has made an ongoing effort to increase their socioeconomic standards. For their social and economic upliftment, the government has implemented a variety of development programs that have resulted in a significant improvement in their way of life by increasing their education, economics, communication, health, and sanitation, among other things (Bhattarai, 2015).

CHAPTER 3. CASE STUDY

3.1 Case study India

3.1.1 Introduction

The Santal tribe is India's biggest tribal group. Most of the people of Santal are poor, marginalized and lead a simple life. With no steady source of income for most people, the only way to lead a comfortable life is to use all the natural resources around them efficiently and carefully. Santali belongs to the Austroasiatic subfamily and is classified in the `Mundari` language group. They have their own scripts called OlChiki discovered in the 1920s by Pandit Raghunath Murmu. Initially`` OlChiki ` is considered a copy and is also considered a literal without any linguistic features. In 2003, Santali was included in the eighth list of the Indian Constitution. The Santhal's work centres around the woodlands where they live. The forest's trees and plants meet their fundamental requirements. They also made a living through hunting, fishing, and farming. They are skilled in making musical instruments, rugs, and baskets out of trees.

3.1.2 History

Historical linguist Paul Sidwell (2018) argues that Austro-Asiatic speakers migrated from the Indochinese peninsula to the coast of Orissa between 4000 and 3500 years ago. Austro-Asiatic speakers spread from Southeast Asia and were widely intermingled with local Indian groups.British authorities aim to expand agriculture to increase income. They encouraged the Paharia of the Rajmahal Hills to engage in sedentary farming, but they refused to cut down trees. British authorities later contacted the Santal family, who were willing to clear the forest for sedentary farming. In 1832 many areas were designated Santal Pargana. The Santal tribes of Cuttack, Dhalbhum, Birbhum, Manbhum and Hazaribagh settled there and started farming. Britain taxed these santals as income. Taxation and exploitation by zamindars and moneylenders caused rebellion in Santal. Sidhu and Kanhu Murmu are his two brothers who led the Santals into battle against the British but were defeated.

3.1.3 Dress and ornament

Santal's traditional dress and plain clothes set them apart from other communities. Male members wear hand-woven loincloths (kachas), balustrades, shirts and shawls (gamchas), while female members wear green or blue checked sarees. But these days they use factory-made clothes. A Santal woman likes to wear jewellery, such as hairpins, coins, necklaces, bracelets, ankles, etc. In the old days, heavy silver jewelry was worn, but under the influence of modernization, new generations prefer plastic, glass, and lighter silver jewelry. Tattooing has become an outdated tradition in the past.Santali belongs to the Austro-Asiatic subfamily and falls under the Mundari language group. They have their own script called OlChiki which he discovered by Pandit Raghunath Murmu in the 1920s. First of all, "orchiki" is considered a copy, a literal word with no linguistic features. In 2003, Santali was included on his eighth list in the Indian Constitution.

3.1.4 Culture

The Santhal tribe appreciates and loves dancing. Dancing is an activity that is already in their blood. It is an important part of Sanhal fairs and festivals.Santa Claus relaxes with soft music and dancing after a long and hard day's work.Santal women wear white sarees with red trims , dance in turn. Besides dancing, Santal amuses, amuses and plays good music with tirio (seven-hole bamboo flute), topless (korom), short neck (hotoku) and head (bohok), pet banam. The Santhal Tribal Community has no temples of its own and does not even worship idols. The Santaru people also have traditions and ways of life in their society and practice them in their daily activities. The customs and ethnicity practiced in Santhar society are important aspects. From birth to death, they look forward to this opportunity. A baby's birthday is much more sociologically important in Santal society. Infertile women are placed in a lower position and disadvantaged in society. In Santal society, births are always welcome and boys are preferred over girls. After delivery, midwife Santal "Hadibdi" cuts her child's umbilical cord with an arrow and buries it near her door. A child is called a few days old or odd days old. The eldest son takes his grandfather's surname. Second, the boy is named after his mother's side. Birth is an important biosocial event in any society. This creates a new placement in the structural relationship. People who rely on their birth as a sociobiological event observe certain taboos and refrain from anxious activities for varying periods of time (Todu, 2011). Innate habits are reflected in dirty times, taboos, naming, ear and nose picking, shaving the first head, etc. It also connects the Marriage is an essential ceremony, and a number of formalities take place in Santal marriages. Santal has different types of marriages.

A man can talk to her second wife if his first wife is infertile, and he can marry a widow if his brother is dead. However, in any case, you must obtain your ex-wife's consent to the arrangement. Divorce is easy. However, some alimony should be offered for the entire divorce. Divorce is a common sequel to Santal marriage. Death in old age is welcomed because it involves transformational events in a person's body and soul. Only male members participate in death rituals. The dead are both cremated and buried.

3.1.5 House settlement

The village of Santal is surrounded by farmlands, meadows, ponds, cemeteries and a common place of worship known as Jaher Era or Jaher for short. Located on the outskirts of the village, Jahel is a sacred moat with monkey trees said to be inhabited by the gods (murmu, 2012). Santal villages are usually very large, with 50 to 100 households. Their homes were within boundaries laid out in a straight line on either side of a broad village street.

3.1.6 Settlement varies with the time

As structural materials, bamboo and Sagaah (a shrub) are utilised. Jhanti is a primitive and primitive type of home construction. The key materials, as seen in the photographs, are bamboo, twigs, hay, and even mud. Will have no formal windows or doors / sills, roofs, yards, etc. Several bamboo sticks dug into the line form a rectangular or square area 5 to 10 feet wide and 10 to 15 feet wide. On top, attach bamboo sticks to the branches on one side and spread dry grass to form a roof. Perhaps this represented a time in Santal's life when her forest-dependent economy was not being strengthened to provide the foundation for a larger home. It could also be because the clan is in a state of migration and not remember to finally settle on the site (Todu, 2011)

Figure 5: santhal dwelling

source: emikiranam .com

Community leaders are believed to have begun building the adobe wall in the late 19th and early 20th centuries. If janti-style dwellings represented the nomadic life of the Santal people, which was primarily based on foraging and hunting, the transition to adobe dwellings occurred when they were firmly entrenched in a sedentary agricultural life. Interestingly, since the enactment of the Forest Act in 1865, which restricted people's unrestricted access to forests, the forests in the Sinboom area have come under government control. As a result, shrubs and wood were no longer abundantly available due to the development of mining and industrialization. Burj Kuntiora He is the sum of two words, Kunti meaning a pillar or piece of wood and a 'bulge', i.e., a surrounding wall or tower. That is why the large mullion house type that supports the roof has a proper name. A truss consists of one or more beams (orah) placed on two pillars of he on the walls on either side. A ridge beam is a combination of her two beams of a specific size. Therefore, the length can increase the roof and space. The use of bulges is the result of contact with the Turks. This is reflected in their folklore. In the history of Onishi Odori, it refers to the king of "Turkey" whose army kidnapped two strong santal women named Kajol and Ayon. As the Burj Kunti Ollah took root in the fluent Santal family and spread, some modified patterns of the system gained popularity. These are his eight sloping aschara-style roofs of the Burj Kuntiora. A rare type of place, however, is the four-sloping-roofed house known as the Chaar-Chala. In Ath-Chala a padh (ridge beam) is supported by his Buruj Khunti to withstand critical loads. The burj kunti is erected vertically on the 'ura'/'dharna'

Figure 6: santhal dwelling

source: emikiranam .com

(beams/joints of double-sided walls). Pads (ridge beams) are connected to karkhas (beams that form slopes). The trusses are centrally anchored by frames called dacha cuts and dash pads to support the truss and roof.

Figure 7: santhal dwelling

Source: emikiranam.com

Santhal's houses, known as Olah, are large, immaculate and charming, with vivid paintings on the exterior walls. The lower part of the wall is painted with black clay, the middle part with white clay, and the upper part with red clay. The houses have many rooms and are covered with local bricks (khapar) or straw (busub). The walls are made of wooden planks covered with cow dung and mud. Each house has a long porch. The rooms are very spacious. Ancestral spirits are worshiped in a sacred area called the Bitar in the corner of the main room. The main room is separated by an adobe wall.

3.2 Case study Bangladesh

3.2.1 Introduction

Santal are one of the oldest indigenous people Bangladeshi communities. Many historians call them: Greater Bengal's earliest settlers. They mainly belong to it Austroasiatic languages of pre-Aryan settlers. Existence Indigenous communities of the country, they must have it is more influential and develops. But the reality is another way. Santal is in many ways denied state privileges and rights and has a distinct historical past. The Santal people, who live in isolation from the mainland people, have never received the attention they deserve. Rather, they were tortured and oppressed by both colonial and postcolonial rulers, leading to this. They start a lot of resistance. But in the end, these resistances couldn't stop it altogether. deprivation. Despite all these challenges, Santal people still struggle to maintain their socio-cultural traditions.

The Santal are one of the oldest tribal people in Bangladesh. They are mainly concentrated in the Rajshahi, Dinajpur and Rangpur districts. Approximately 150,000 Santal people lived in Bangladesh in 1984, according to estimates from various sources (Ali 1998). However, due to the lack of a tribal breakdown in the census report, we cannot provide up-to-date information on the number of Santal people. Santals was originally a resident of Chota Nagpur, Santal Pargana, India. During the British era, they migrated to various areas, including Bangladesh, and sought jobs such as farm workers, track installation workers, deforestation workers, and farmland reclamation workers (Anwar 1984, Hossain and Sadeque 1984, Siddiquee 1998).

3.2.2 Culture

The role of women in the family is by no means important, but the dominance of men is more pronounced in Santal society. Women in Santar are more likely to play a leading role in earning a living or working in agriculture. The Santal house is small, but the garden is very clean. The artwork on the clay walls of the house attests to Santal's love for beauty and their artistic spirit. The furniture in the house is very simple and reflects a simple lifestyle. Santal society is still governed by the traditional Panchayat system, and village heads enjoy special dignity in society. The division of the community into 12 Gotras (clan) is still seen among the Santal people. Marriage of men and women of the same Gotra is generally prohibited. But these regulations are not as effective as they are today. Santali (Santali) belongs to the Austrian family. Santali is very similar to Cole and Mundari. The majority of Santal people in Bangladesh nowadays are bilingual in Santali and Bangla. Additionally, Santali is now home to many adopted Bengalis. Despite the lack of documented Santal literature, everyone is aware of the rich history of Santal folktales and folklore. The Santal people have a religion but no official script, similar to how they have a language but no alphabet. In the desperate and poor life of the Santal people, the work of Christian social welfare missionaries and the accompanying declaration of the message of spiritual peace hastened their conversion to Christianity. On the other hand, financial support from NGOs has increased the desire of Santal people for modern education, but poverty is a major obstacle. Landowners and moneylenders had complete control over and exploited the Santal community. Between 1946 and 1950, the Santal actively took part in the Tevaga movement. The bodies of Santal people are burned. Today, however, a large number of people are burying the deceased in graves. It is the village mayor's duty to report the death of the villager to the scene of the deceased and to perform the last rites with respect. The practice of performing sraddha (funeral) rituals later at the right time is also practiced in the Santal community.

Figure 8 : Santhal dwelling

Source: emikaran.com

Figure 9 : Santhal dwelling

Source: emikaran.com

House and settlement

The people of Santals are mainly dependent on agriculture and are therefore very vulnerable to natural disasters and climate change. Mud and straw, two inexpensive and typical materials, are used to build their homes, mostly for the roofs. They still use these materials because they don't have enough income to buy bricks and metal roofs to build houses. The traditional building can be improved upon in tradition, using cheaper materials as well as introducing some engineering knowledge to reduce disaster risk.

Figure 10: santhal dwelling

Source: emikaran.com

Cattle manure is used to fuel the fire, a sustainable way to meet the limited supply of firewood as a result of deforestation in the area. And unlike other poor villages in the world with no waste management, this one is extremely clean, with no paper or plastic around. The santhal follows linear settlement plan. It consists of single and double storied mud house with full of beautiful paintings in the wall of house. Thus, architecture in santal varies from single storied small hu to double storied large building of double tier tile roof.

CHAPTER 4. RESEARCH METHODOLOGY

4.1 Introduction

This chapter largely discusses the study's procedures, data sources and kinds, and data selection and analysis approaches. Furthermore, it displays the study's efficacy and trustworthiness, as well as concerns for the technique utilized.

4.2 Method

According to a researcher in research methodology (Yin, 2009), the design is a logical process that relates empirical data to the study's first research question and, lastly, to its findings. In this scenario, research design is a rational strategy for getting from here to there. They can now be characterized as a set of questions to be asked first before drawing conclusions. Procedures such as gathering and evaluating pertinent data may occur during the course of the inquiry. Based on this premise, the case study technique was chosen as the preferable design to give full information and an explanation of the characteristics of the indigenous dwelling. This strategy is appropriate for answering "why" and "how" inquiries by offering extensive explanations of various social processes. This research was carried out at a specific place by thoroughly investigating the phenomena. Its primary goal is to create a that has the qualities and changes of a Santhal private residence (Yin, 2009).

4.3 Selection of Cases

According to Yin (Yin, 2009), researchers have the authority to choose instances or use certain procedures depending on past information or the degree of complexity of the case. As a result, concentrated case regions known as satar village are chosen. The clusters are close to. Researchers were interested in learning about altering patterns in Satar Village as a result of several factors. The walled villages chosen for study are adjacent to each other. Furthermore, the residents of the notable walled towns chosen in instances speak their own dialect of language, which influences their way of life. This contributes to the knowledge required to compare the nature of the Santhal native home conversion in the various contexts (Yin, 2009).

4.4 Type and sources of data

Primary and secondary data were employed in the study. The core data was acquired through interviews, focus group discussions, and observation, as well as a structured and unstructured questionnaire survey. Secondary data was acquired from Santhal area studies and literature produced about the subject region (Yin, 2009).

4.5 Data collection techniques

We primarily collected data in this study using techniques such as in-depth interviews, focus group discussions, and direct observations. Sketches, maps, photos, and papers were also employed as data collection approaches.

4.5.1 In-depth Interview

Interviews, according to Yin (Yin, 2009), are one of the most commonly used data sources for case investigation information. In order to create and establish cases, detailed interviews are required. The extensive interview's goal is to collect facts and perspectives on the factors that influenced the formation and change of the santhal private residence. It was attended by community elders, clan leaders, individual condominium owners, and housing experts who are said to be well-versed in the community's housing customs. It aided scholars in locating reliable information about the Santhal case culture (Yin, 2009).

4.5.2 Focus group discussions

Focus group discussions (FGDs) are a popular approach for gathering extensive qualitative data in a wide range of descriptive research, including case studies, phenomenology studies, and natural science investigations. The primary purpose of focus group discussions is to allow members to exchange ideas on a certain topic of study. The debate will be led by the moderator (Yin, 2009).

4.5.3 Direct Observation

According to Yin (Yin, 2009), case studies allow for direct observation. Observational evidence is frequently useful in providing extra information about the subject under inquiry. As a result, researchers utilized observations to collect data. I spent days collecting data from the target group. This gives me the opportunity to collect real data through personal observations. Because they could observe the theoretical concepts being addressed in the classroom and what was actually happening, direct observation provided a thorough data collecting technique. It also aided in the collection of critical data for the inquiry.

4.6 Sample size and sampling technique

The variables in place for case selection are accessibility and location. Morang district Ratuwamai municipality has a higher concentration of Sathal people. The fact that three of the villages are near to Woreda town and the other two are far away allows us to assess the impact of the urban environment on them (Yin, 2009).

4.7 Techniques of data analysis

The study's data was presented and subsequently examined utilizing photographs, drawings, maps, sketches, and tables. The analysis was carried out in response to survey questions. To put it another way, the survey questions were regarded as a theme, and the data from both cases was examined independently for each kind. Furthermore, data on the same issue gathered from several persons was presented and examined one by one. Triangulation is used to determine the crucial point. Following that, it was interpreted by providing necessary explanations for each of the data evaluated (Yin, 2009).

4.8 Validity and reliability

The survey was primarily designed to address the "reasons and methods" of Santhal native housing features and shifting trends. As a result, a case study is an excellent design for this. A qualitative data collecting instrument was used to obtain research data from a representative and informative sample. Target was able to freely reveal the last bit of information it knew because to the data collecting tool. The data was also qualitatively evaluated and interpreted by the researchers. As a result, our study discovered all useful data and reliably transformed it into output (Yin, 2009).

4.9 Reflection on the methodology

In this study, we analyzed and interpreted the data using qualitative methods. This gave researchers a comprehensive presentation of all the information gathered from the target population, giving them the flexibility to discuss every piece of information in a way that readers could easily understand. Undoubtedly, it's the right way to help the study achieve with the intended results (Yin, 2009).

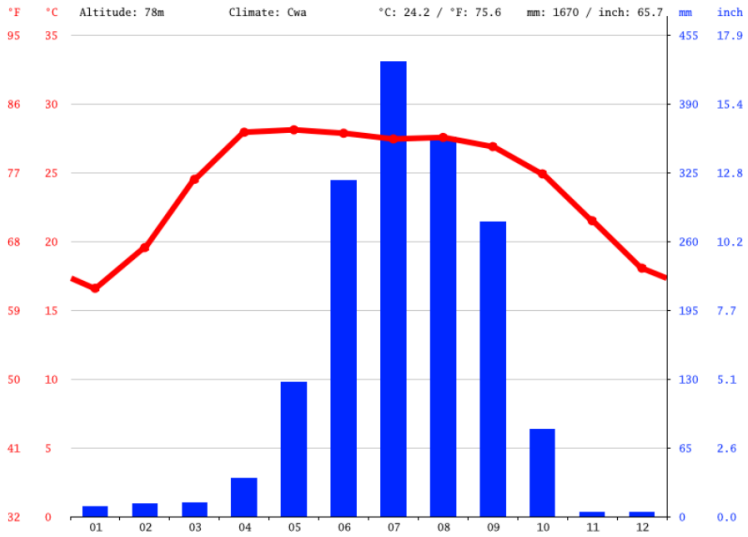
CHAPTER 5. DATA ANALYSIS AND SITE OBSERVATION

5.1 Site location

Morang district is located in the province 1 in the east of Nepal. This is a district of Outer Terai. It borders Bihar, India to the south, Jhapa to the east, Dhankuta and Panchthar to the north, and Sunsari to the west. Morang has eight municipalities, eight rural cities and one metropolitan city (Biratnagar). The total area of Morang is 1,855 square kilometers. The point with the lowest elevation is 60 meters and the highest is 2410 meters above sea level. Morang's headquarters is connected by the Koshi backbone with Mahendra's east-west backbone at Itahari, Sunsari, and Morang is also connected to the eastern mountainous regions of Nepal. Morang is the central industrial zone of the eastern region of Nepal. Satar gaau or Santhal village is 1 km from sauntha chowk. It is just 100m inside the main highway. Sauntha includes all castes like Brahmin Chetri, Madhesi, Rai, Limbu, santhal etc. For the study, 7 different houses of satar gaau were selected according to their materials and social status.

5.2 Climate

Urlabari is located in the Northern Hemisphere. Summer lasts from the end of June to the end of September. Summer months are June, July, August, and September. July (85.12%) has the highest relative humidity of any month. March (42.92%) has the lowest relative humidity of any month. The month with the rainiest days is July (28.03). The month with the least number of rainy days is December (0.63 days). The climate of Urlabari is warm. It rains a lot in the summer here, and it hardly rains in the winter. The climate here is classified as Cwa according to the system. The average annual temperature in Urlabari is 24.2 ° C | 75.6 ° F. Precipitation here is about 1670 mm | 65.7 inches per year (Geiger, 2022).



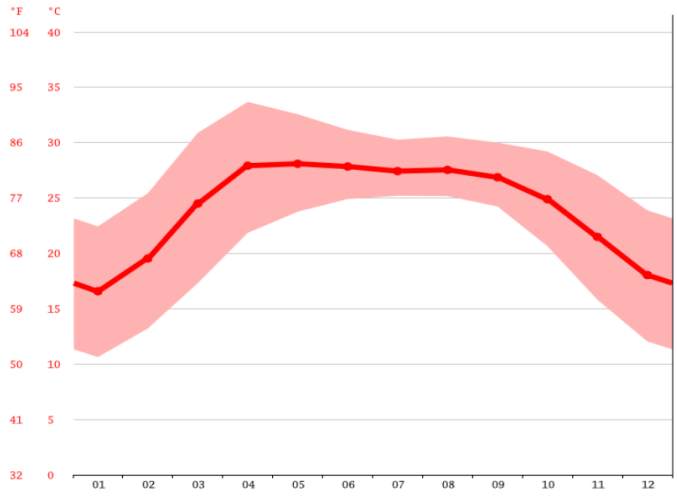


Figure 11:climate of Morang

5.3 Site planning

Santal people usually live in their own villages arranged in a street pattern, each with 50 to 100 inhabitants. Although separate villages are desired, many groups may coexist in close proximity to mixed village or town tribes or subcastes. Most of the settlements are near water resources and roads. This is clearly a village of with settlements located along the main road. A linear layout of this settlement to protect it from the scorching sun. The compact plan changes the sunshine of individual homes by minimizing the sunshine of individual homes and, as a result, shading each other and reducing the outer area. However, especially when the plan is offset at an angle to the prevailing winds, the linear placement is maximized and a slipstream is created due to the low pressure behind each house. (Moore, 1993, p. 180) Best results are obtained when the direction is offset by an angle with respect to the prevailing winds.

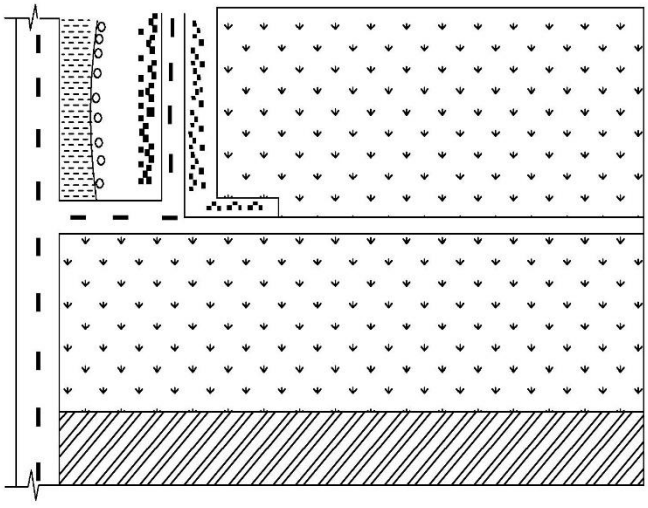


Figure 12: site plan

In general, Santal's community life is concentrated in the village. On both sides of this street, there are houses. Santal's residences are never alone since they want to live in communities. Santal's belief in the human spirit, human beings are part of nature. Natural phenomena that occur for specific reasons can be a precursor to the future (Culshaw 2004). In past history (Head of Santal Village) during the selection of a new settlement site with 3 or 4 Mengo to explore the spots in the forest. When he saw the footprints of a tiger after entering the forest, birds sitting quietly on the eggs, it's lucky for them. To their faith when they settle in this place, In the future, their village will be prosperous. The next day, they test the precursors When they settled in that place. People start to settle his house and 5 Sindurmarks. They have a modest mound of sun-dried rice next to Sindurmarks. Water is contained and held. Then, he neatly separates and binds three hens in a row (one spotted, two white). He misses the rice completely. Seriously and his deputy visit the same location for an investigation the next morning. when it comes to, they predict that adults will pass away within a few days when a huge bird's feathers fall. If it's little, it also has wings. The fallen "children will perish here in the future," it states. And if the feathers haven't fallen, it's great for them. upon the next day, people build shelters for serious reasons. After that, seriously distributes farms and fields Villagers. Then they build their own house. Aid them in constructing a home together.

Figure 13: Settlement Planning

5.3.1 Climate responsiveness

Traditional santhal houses respect passive and natural management strategies of the environment within the structures. Construction engineering and material culture show an appropriate response to Morang's microclimate. The Morang region is classified as a tropical climate with hot summers and cold winters. The hot summer has an effect on the microclimate. To cope with a large, warmer area, mud sloping roofs are common in most of the region's dominant vernacular architecture. Without exception, sandal houses have linear plans and pitched roofs that span the entire form. The roofs are extended to cover most of the exposed surface of the earthen walls. This extension protects the exterior surface from both heat and rain. Construction techniques such as bamboo frames, lightweight building materials and post-rope structural systems have helped the houses in satar village achieve seismic resilience and maintain internal temperatures. The thick parallel walls of the sandalwood house provide excellent support for maintaining a pitched roof. To reduce glare, go inside the room, preferring a small opening. This technique allows hot air to circulate to the outside. The Sandalwood house with its large veranda is a great example of vernacular design. The more shaded awning also provides a sufficient barrier against rain while driving. The wall is a good example of a

passive thermal design. Bamboo walls with a layer of mud on the surface. It acts as a good insulator against heat. However, old sandalwood houses have few climate problems. The internals do not have cross ventilation for the linear planning system. The thick mud walls of the rooms block out natural light well. Many examples of untreated wet conditions due to unpainted walls and floors have been found.

5.3.2 Green, plants, Vegetation

Historically, santal society has developed in a local context. In Nepal Most of santal population lives in rural or suburban areas. In most cases santal lived in a natural water source. However, if there is not enough water, the santal prefer to dig big. community pond. The pond is also an important element for ceremonial purposes. Vegetation is important Part of the santal village. Lots of green trees are planted to define community boundaries. These tree line limits prevent soil erosion. Some of family has a small home garden for growing up seasonal vegetables. Dried reed plants are widely used in building work bamboo for making walls. The santal are particularly competent at utilising the different medicinal plants available in the area. Furthermore, holy groves have great religious significance in santal culture. They were among the first instances of communal nature conservation.

5.4 Varieties of Building for study

5.4.1 Cave dwelling:

When the Santal were small in number, they used to live in caves (Dandhor) or on tree trunks and hunted, gathered, and collected their food in the forest. They began traveling from one jungle to the next as food became scarce. However, as their numbers grew, they were unable to harvest food from the forest or to feed themselves. They make shelter from the elements in tree trunks or caves.

Figure 14: Cave dwelling

5.4.2 Cottage

Cottage is primitive building form, it's a makeshift building that's erected across agricultural grounds to keep grains safe. When this cottage is prepared for a temporary settlement purpose, i.e., when a man and his family live within it, However, this is the most primitive form of settlement structure, though it is now prepared beside agricultural land for crop protection, as a temporary hut before the construction of permanent mud-built huts, or as a temporary dwelling before the construction of a new mud-built hut if the permanent hut is destroyed by storm or flood. It is built in a very straightforward manner. Two bamboo poles are buried on two sides at first. These are known as Khunti. The entrance to the hut. These are also called flutter. All of these poles are tied tightly with rope (you can make them yourself or buy them on the market). Then, on both sides of this structure, use palm leaves or palmyra leaves, or rice straw to add straw.

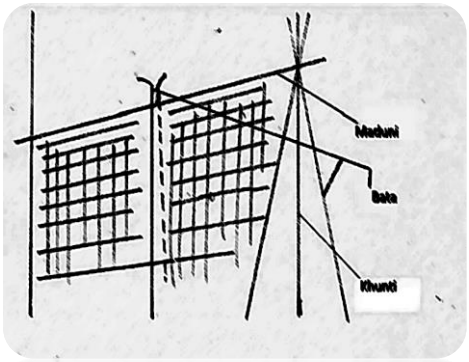


Figure 15: cottage

5.4.3 Case 1: Jhanti Orak

House Description

Jhanti orak is the primitive santhal house which is rarely found in present scenario. But still in certain area it is used as grains store or animal sheds.

It consists of narrow entrance with no opening as it consists of ventilation through the wall as it only consists of bamboo stalk with no opening.

Figure 16: Jhanti Orak

Construction technology

It has the shape of a cube. Generally, four trunks of Matcom (Mahua) or bamboo are buried in the four corners. These trunks are then connected by bamboo stalks at the top and tied together with ropes or fibers made from tree stalks or verbena leaves. Another bamboo trunk is tied to the central part of the roof to strengthen the structure. Finally, the walls and roof is covered with verbena or date palm or palmyra leaves and connected to a wooden structure with ropes or wooden cords made from the stems of wetland plants. Today, clay is painted on the wall and roof. This is built only before the end of the permanent resident structure for the formation of new settlement formation or for protection observation. Repeatedly, durable huts were destroyed by unhappiness,

Planning and concept

Jhenti orak was built for temporary apartments. It is also called Sakam ORAK (hut from leaf). The width of 4 meters wide and the length of 6 feet maintaining four hands. The interior is asleep and is only used for storage of home elements. Cooking and food cannot be cooked with Jhentiorak. It is stored outside the livestock. There are no sanitation and drainage systems in huts. The location is so small that families can hardly afford to stay in a hut. In general, male members slept outside the hut and female members slept inside the hut.

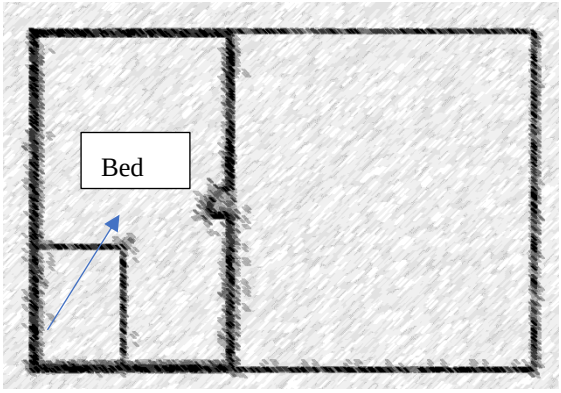


Figure 17: Plan of Jhanti Orak

Socio- cultural aspects

As tribal population find better place firstly, they start to make temporary settlement. As the santal people used to migrate in a group and started to build the settlement near forest and water resources as firstly their main income sources depend on natural resources. As the santhali people worship natural resources rather than the idol. Small place is separated for god.

5.4.4 Case 2: Kumbha Orak

House Description

As santhal find out the better place to stay they started to build the better house of thatch and bamboo and further mud plaster is doe for better insulation purpose.

Figure 18:Kumbha Orak

Community leaders say they started building mud walls sometime between the late 19th and early 20th centuries. If Jhanti-style dwelling represents the nomadic way of life that relied primarily on foraging and hunting during this era, the move to housing happened when they decided to embrace a sedentary peasant existence. What's interesting is that during these years, Forests in Morang area have been increasingly placed under state control restricted people's right to unhindered access to the forest. Shrubs and wood are no longer abundant due to deforestation in past days.

Planning and construction

Kumba turned out to be the next type of structure developed by the Santals. It was constructed using stronger materials such as mud, grass mixed with murom (gravel), and Sal wood or bamboo poles used for columns and beams. One side of the construction is raised to create a basic pitched roof. Kumba possesses the most powerful force for quenching nature's fury. This shift aligns with the group's shift toward a less nomadic, more sedentary, and community-managed communal village life. It is available near villages and has begun to be utilized for home development. Today it is still prevailing as temporary house to stay before making permanent structure.

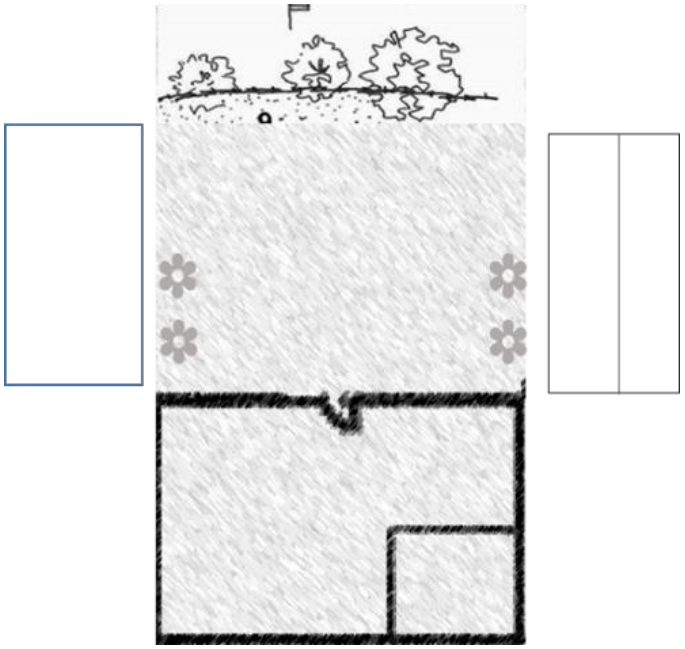


Figure 19: Plan of Kumbha Orak

5.4.5 Case 3: House of Mud with Thatch roof

House Description

The occupation of Lakhan Murmu is daily wage. They consist of nuclear family house of Lakhan Murmu is built of mud. Lakhaman marmu is the member of village council.

Figure 20 :Santhal dwelling case 3

Planning and construction

The walls are made of mud plaster with cow dung, mud and husk. The roof consists of thatch roof of straw. Hasa (soil) Orak and are used for permanent inhabitation in a settlement classified in several types, viz. Gitic Orak (the main dwelling house or house for sleeping), Dakae Orak (store room and kitchen.)

Separate structure for animal shed, kitchen and sleeping. The interior of house consists of two room one - storage and bedroom next room with worshipping, storage and sleeping. Other separate structure is also built for the other animal Dangra or Gei Gora (cowshed), Sukri Banda (pigsty) etc. It lacks proper ventilation and lighting. It is found less in number.

Socio-cultural aspect

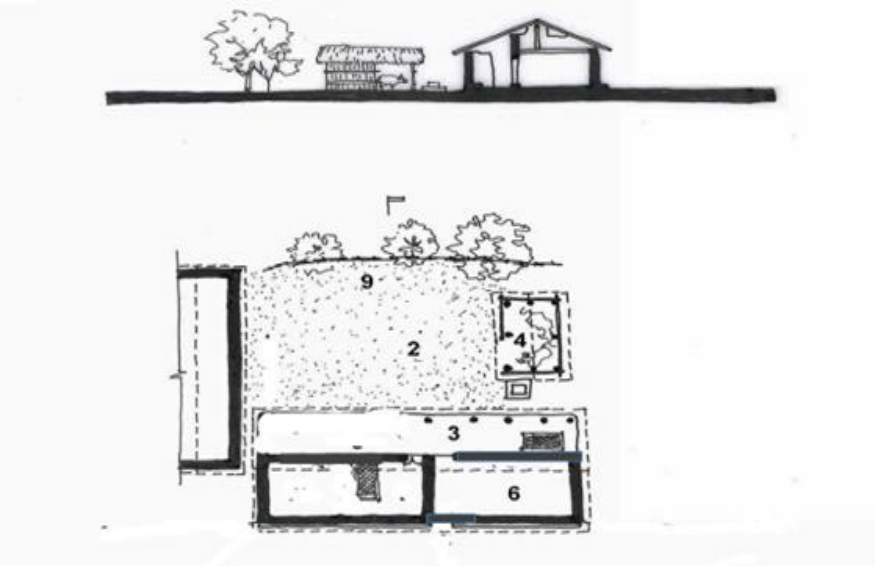


Figure 21 plan of case 3

The small portion is separated in bedroom in order to create small worshiping area for God. Front verandah space is created as resting as well as socialization space in the community. The courtyard space to carry ritual and also gathering space.

5.4.6 Case 4: House of Mud with C.G.I Sheet

House Description

The occupation of Hapna Soryan is teacher. They consist of nuclear family parents and their children. The structure is made up of mud. Hapna Soryan is also only member of village council.

Figure 22: Santhal dwelling case 4

Planning and construction

The walls of Hapna Soryan are made of mud plaster with cow dung, mud and husk. The roof consists of CGI sheet in main house and thatch roof of straw in kitchen and animal shed. The small ventilation is created on verandah space. It is use to view various ritual present in village. The small wooden window is used for lighting and ventilation purposes. The guuest room in outer verandah part. It enhances of opening for light and ventilation by use of comparatively larger window and ventilation. The Courtyard space use as worshipping place during different rituals

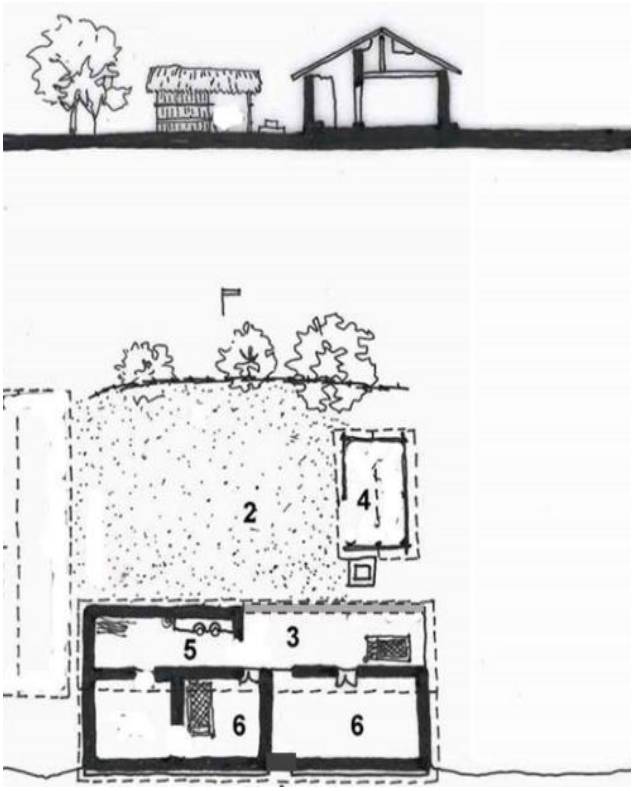


Figure 23: plan of case 4

Socio- cultural aspects

The small portion is separated in bedroom in order to create small worshiping area for God. Front verandah space is created as resting as well as socialization space in the community. The courtyard space to carry ritual and also gathering space.

5.4.7 House of Mud with C.G.I sheet

House Description

It is the head of customs and dancer called Jog majhi. The house of jog majhi is in outer skirt. It consists of large frontal open space for practicing dance and costumes.

Figure 24: santal dwelling of case 6

Planning and construction

The materials use for construction of house is mud with CGI roof. It doesn't consist of courtyard planning but consist of backyard spaces. Moderate window for lighting and ventilations is provided. The large frontal area for practicing zone and backyard space is provided with animal husbandary. The interior space with modern decorations.

Socio- cultural aspects

The small portion is separated in bedroom in order to create small worshiping area for God. Front verandah space is created as resting as well as socialization space in the community.The courtyard space to carry ritual and also gathering space.

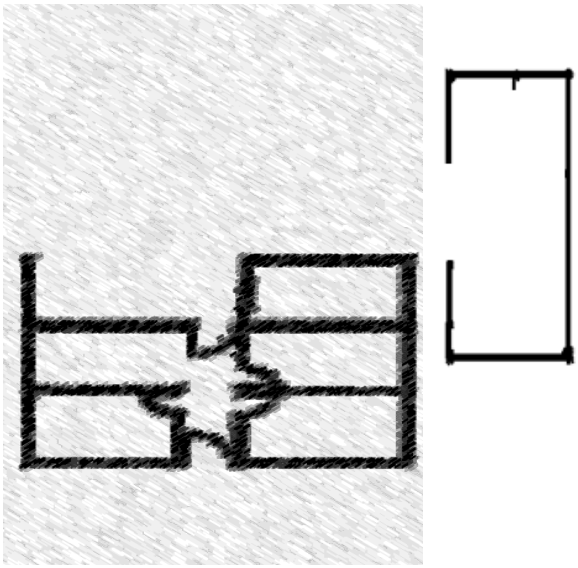


Figure 25: plan of case 6

As said by "socio cultural as well as economic aspect aafect the santhal architecture as I am the head of dancer so the house my is design by keeping clean space in frontyad for practicing dance it symbolizes that social aspect effect the plan of santhal house" (Tikaram soryan, Jog majhi).

5.4.8 Case 5: House of RCC with C.G.I sheet

House Description

It is the house of head of Village council (Majhi). The house of head also represents his power in form of architecture comparatively others village member. The house is larger in size with a greater number of rooms. The material use for construction of house is cement, Brick.

Figure 26: Santhal dwelling case 5

Planning and construction

It consists of courtyard planning the small mandap is presence in courtyard to represent various rituals such as birth, marriage ceremony.

The reward punishment and all rules and laws are guided by him in village Majhi as his status is high in village. In similar way his home also represents his status. So, he consists of comparatively larger house. It consists of comparatively large window and ventilations. Verandah is present to look different rituals and also look after the village member. It consists interior space with modern decoration

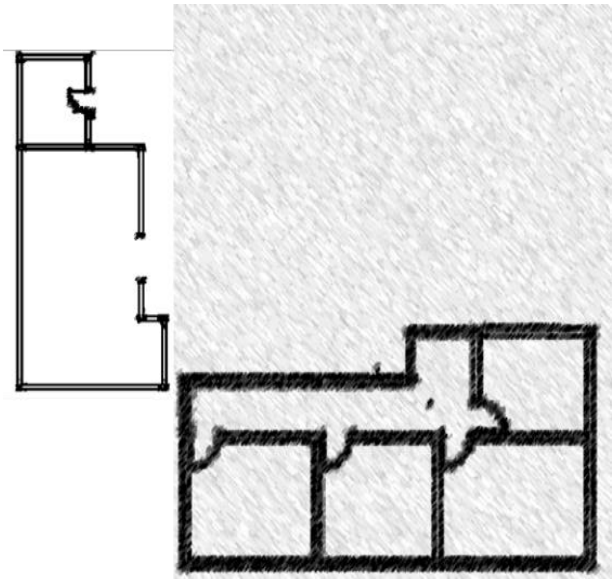


Figure 27:Plan of case 5

Socio- cultural aspects

The small portion is separated in bedroom in order to create small worshiping area for God. Front verandah space is created as resting as well as socialization space in the community. The courtyard space to carry ritual and also gathering space.

As said by Respondent Bhagwan Soryan"My house is of RCC structures to fulfill the need of modern context as the member of family require more private space thus need to design the house with more number of room so I refer to build RCC structure large house as it also reflect my status in the form of house. But it still I love the traditional form of house so my kitchen is still made up of mud architecture and we believe that God exist in our traditional mud house rather than concrete home so I worship local Bongas in my mud house. Most of house in present context started to build RCC structure to meet present need and follow the trend" (Bhgawan Soryan, Head of village council, Majhi)

5.4.9 Case 6: Modern houses from Traditional type

House Description

It is the house of Lukhiram soryan who have change religion from Sarana to Christian.

According to him main region to change in religion is poverty. He also shows the Christian norms and values also has been influenced. He says that Jesus help to uplift is life. As they have given free education to his children which he cannot afford due to which today his all children are doing well.

Figure 28 :Santhal dwelling of case 7

Planning and construction

The walls of older house of Lukhiram soryan is made of mud plaster with cow dung, mud and husk. The roof consists of thatch roof. The small ventilation is created on verandah space. It is use to view various ritual present in village. The small wooden window is used for lighting and ventilation purposes. The Courtyard space use as worshipping place during different rituals.

Socio- cultural aspects

The small portion is separated in bedroom in order to create small worshiping area for God. Front verandah space is created as resting as well as socialization space in the community. The courtyard space to carry ritual and also gathering space.

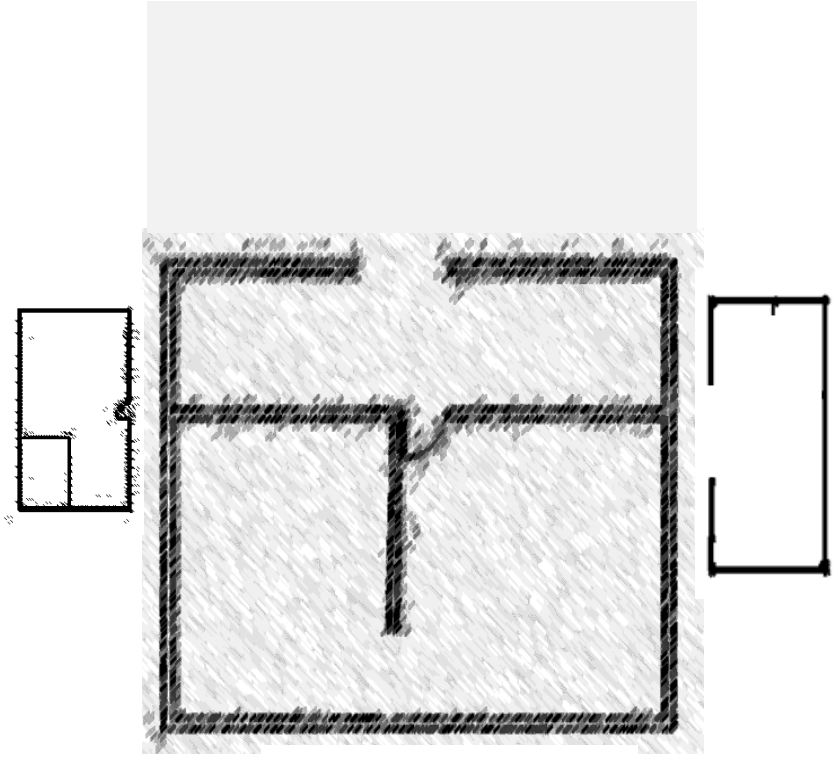


Figure 29:Plan of case7

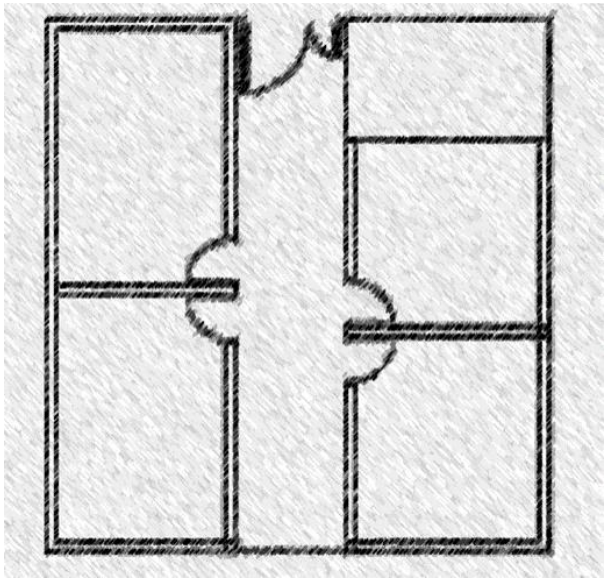


Figure 30 : Present plan of case 7

Figure 31: Present house of case 7

As said by respondent Lukhiram Soryan “I change my religion from santhal to Christian main reason for change at that period is poverty but today I am happ with the religion. My children get proper education due to the change in religion and now they are cabale and have good earning. Yes, social cultural aspect has been changing with change in religion as the plan of house is also varied but I respect all culture and religion.” (Lukhiram Soryan, Ratuwamai Municipality)

5.5 Cultural area in santhal dwelling:

Place of worshipping Orak Bongas: Every household has its Orak Bonga or spirit or deity of the household. It is worshipped in the Kona Orak within the Gitic Orak of a house or in the Dangra / Gei Gora as per the rules of the house.

a) Place of worshipping Hapramko: Hapramko or ancestral spirits of a house are worshipped in the Kona Orak within the Gitic Orak.
b) Manasa Than: It is believed that Manasa has the mastery over Bin (snake). Therefore, a Manasa Than is located generally, in Ojha Guru's house within the village.
c) Place for Bapla: In Bapla, the ceremony of Sindurdan takes place on the Kulhi, the place in front of the respective house. However, other rituals in Bapla take place on the Raca (courtyard) under a temporary semantic structure called Mandoa or Chamda. If there is not sufficient space on the Raca, then it may take place on the Bargi land.
d) Place of Karam: If Karam tree (Chalita tree) has grown in any house, then Karam festival takes place there beside it.
e) Gor Tandi, place of worship in Sohrae: Gor Tandi is a vacant lot outside the domestic arena, within the perimeter of the village. Bongas are worshiped here during the Sohrae festival

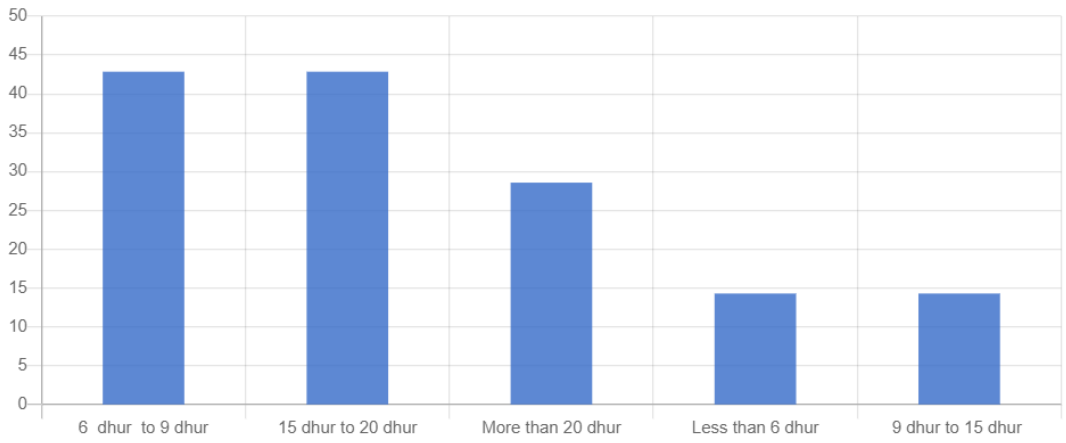


Figure 32: Graph showing plot area

It shows that land use for the construction of santhal dwelling is maximum from 6 to 20 dhur

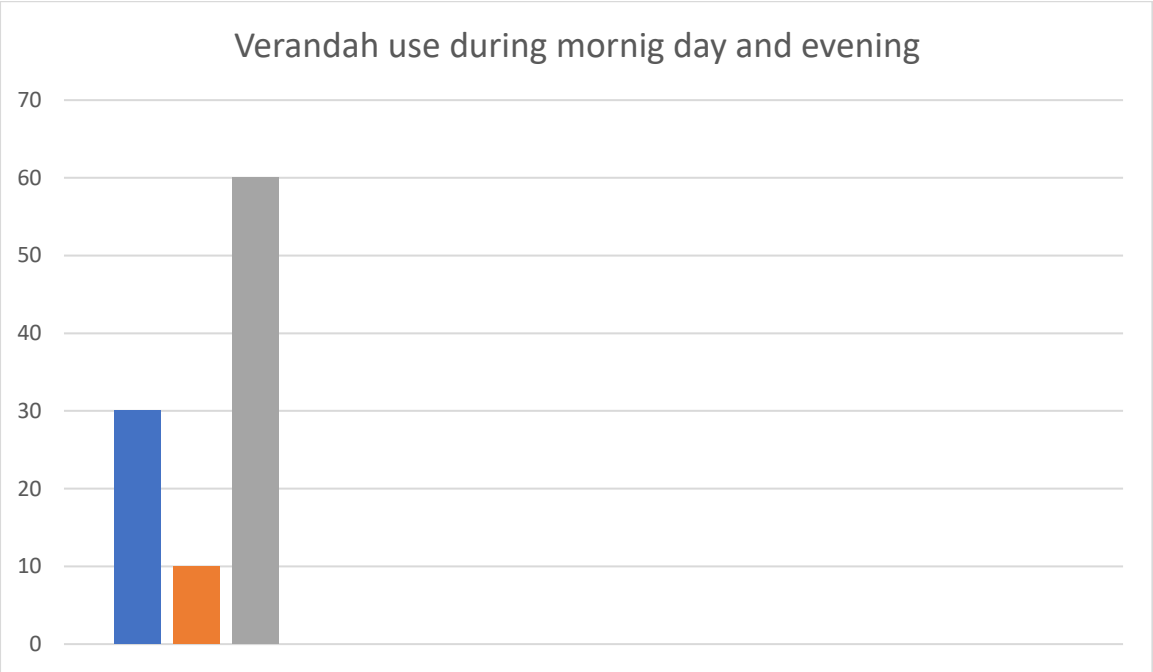


Figure 33: Graph showing use of Verandah

It shows that verandah space is maximum used during evening for socialization

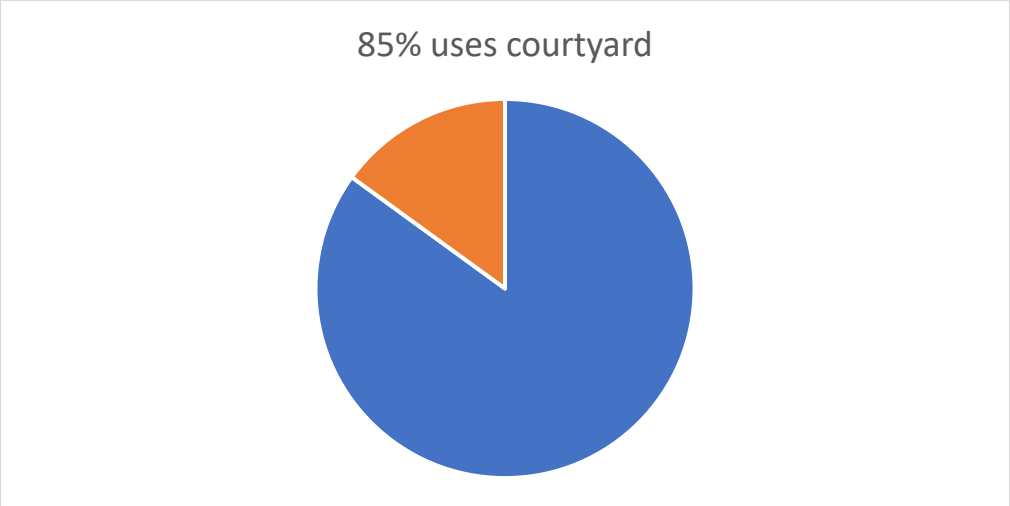


Figure 34: pie chart showing uses of courtyard

It shows maximum people house consist of courtyard

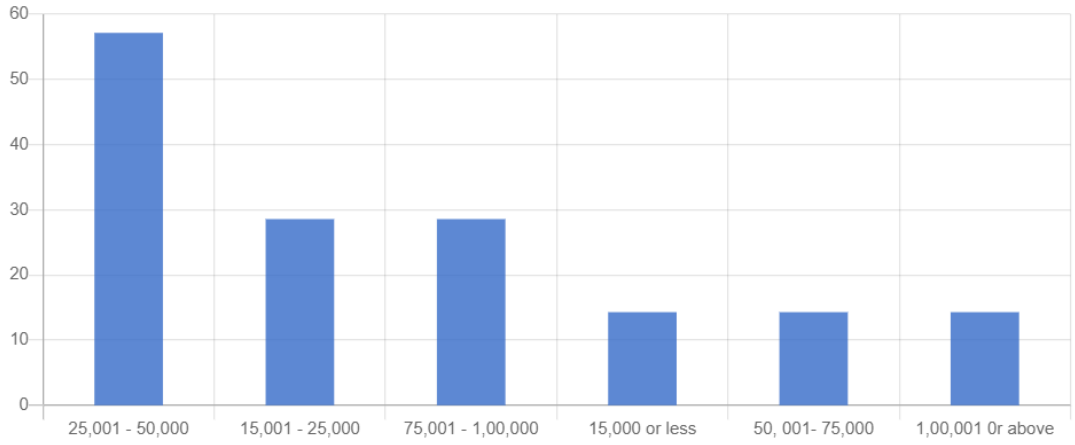


Figure 35: Graph showing monthly income of santhal people

Data shows that the monthly income of santal is mostly 25,000 to 50,000

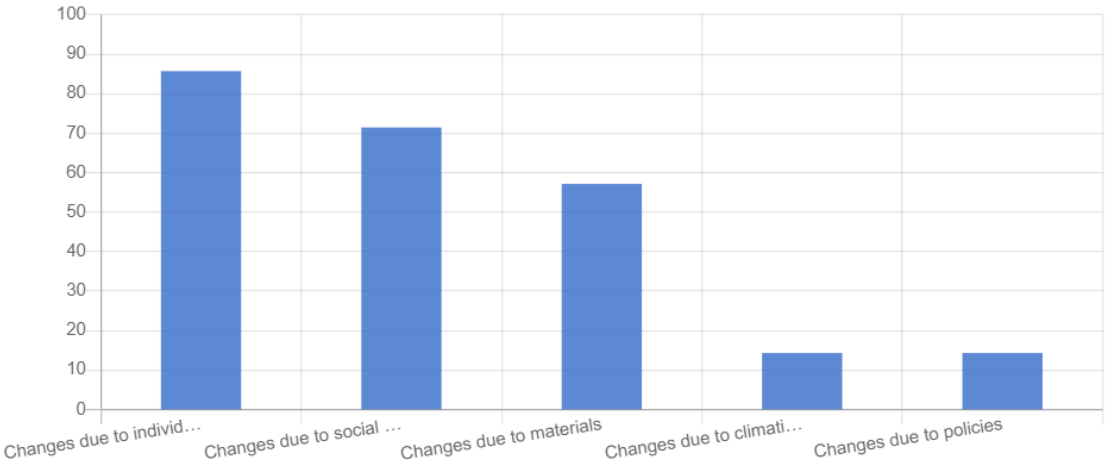


Figure 36: Graph showing reasons for transformation in santhal people

As their economic status rise their living standard rise as major reason found in transformation of house is also rise in individual economy

5.6 Space layout in santhal dwelling

5.6.1 Entrance

The entryway is a vital link between the home and the street, connecting the interior and family spaces to the community and public areas on the one hand. The only way out of the courtyard. The significance of the entry to the home and in the everyday lives of the Santals is suggested by ceremonial actions at and around the entrance, such as plastering a tiny piece of cow dung on the door to the house. During a festival such as Sohrae, all the main and private home doors are decorated with palm designs and vermilion dots, which are considered supplications to Lakshmi. According to phenomenology, the entryway is the physical and ceremonial beginning of a family's internal area.

Figure 37:: Ritual markings such as palm prints

5.6.2 Worshipping area (Bhitar)

It is the most holy section of Santal's dwelling, where families make sacrifices to family spirits, ancestors, and other deities. It is situated in various ways within the interior arrangement of the shell, in the place least accessible to outsiders, and hence, without a doubt, in the innermost corner of the Santal homes. The mud pedestal at one end of the sleeping area is the most visible component of the altar. The foundation is a 50 cm high earth wall, while the top is composed of wooden planks. Also used to keep grains in huge baskets. Only in certain households do those who are permitted to enter the altar claim that the sacred spot is beneath the mud, rather than the entire chamber.

Figure 38: Bhitar

5.6.3 Courtyard (Racha)

Within the home, the courtyard is the major location for socializing. Plastering and cleaning of the area of the ground on a regular basis. The presence of some artifacts indicates their patterns of usage in the home, such as a chulha (mud stove) for parboiling paddy before husking and a tulsi pinda, which is a little mud platform with a sacred plant where women burn a lamp and incense every day as a form of prayer. Most households also have a parkom (string cot) in the racha for guests to sit on. The racha nook used for cooking, notably the evening meal. The racha as a communal space offers an intriguing point of comparison to the interiors of rooms, which may be thought of solely as storage areas with no group activities taking place. Cooking and worship, while taking place inside, are not truly communal activities or places for family contact.

Figure 39:Courtyard

5.6.4 Cooking area (Kitchen)

Private actions performed indoors uncover specified cooking areas. Kitchen spaces are also established throughout the courtyard. Each nuclear family unit has its own kitchen. A mud stove with a low platform surrounding it and several racks to carry utensils is usual in a

Figure 40: Kitchen

space. When they cooked outside, they brought the food inside to eat. The semi-open, verandah-like rooms with a stove employed as an additional necessity for extended family were the second sort of cooking place noticed. Not as open as the mud stove for cooking paddy. Due to their belief in witchcraft, whereby someone with malicious intent might cast an evil eye on food and inflict bad luck onto the one who consumes it, cooking and eating were usually done in a physically or conceptually enclosed place.

5.6.5 Animal Shed

Animals are never chained outside at night, so seek for pet-friendly places. Separate shelters are usually created for different animals such as cattle and goats, while chickens are housed in baskets in the corner of the room. The floor of the cattle barn is composed of stone that has been laid in the mud for easy cleaning. Cattle are normally brought out of their shelter in the morning, watered and fed, and then let to graze. Cattle return at dusk and are fed and watered before being brought to their barn for the night. In other circumstances, erect a fence around the perimeter of their home to keep the cattle confined throughout the day.

Figure 41:Animal shed

5.6.6 Sleeping area

Most Santal dwellings have designated sleeping quarters. When the weather allowed, people used to sleep in the racha on a parkom (movable rope bed). Other forms of adaptations have also found their way into sleeping places. It has a store for personal things such as apparel and cosmetics, as well as calendar images, fake flowers, and posters that cover the walls.

5.6.7 Verandah (Chali)

Both are completely enclosed on all sides or semi-enclosed with only a roof, similar to a warehouse. Typically used as an animal shelter or, in most other circumstances, as a location to welcome people to sit. Locate a parkom (wire bed) stored in the chali. Provide room for activities as they emerge, or shelter for activities during the rainy season. When the family wants extra space in the house, the chali area may be turned into a bedroom by installing walls.

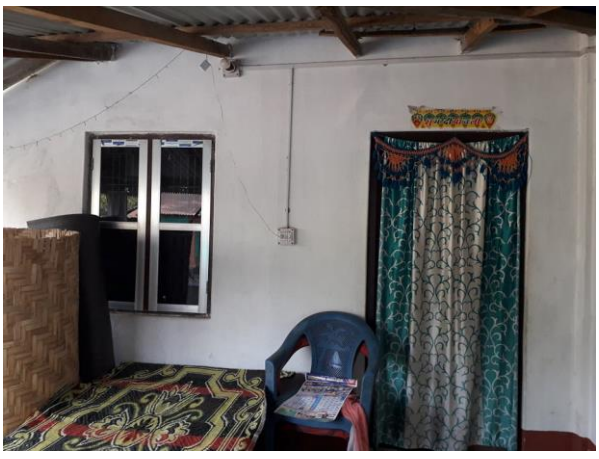


Figure 42: Verandah

5.6.8 Backyard

Use for gardening, storing straw and agricultural equipment, and washing and cleaning activities. They avoid unclean water leaking into other areas of the house or into the street by restricting washing and cleaning tasks. For instance, households that produce food on boats divert effluent from washing equipment to the vegetable beds and squash vines. The houseboat, which connects to the farther-off agricultural fields, is located behind the home. This enables the harvest season's direct loading of the harvested rice into the barge. Haystacks, shattered pots used by hens to lay eggs, and agricultural machinery are additional items frequently seen in backyards.

5.7 Social cultural aspects

The Santhali people are inhibited by a large number of spirits of various types known as bonga that are directly related to the happiness of a particular person or group. Santal's ancestors in critical situations to overcome difficulties that Bonga worshiped. According to Gausdal (1960), one hundred and seventy-eight different bongas are classified into ten major categories according to the nature and function of souls.

Figure 43: Worshipping of Bongas

The Sub-clan spirits - Abge bongas.

Household spirits - Orak` bongas.

Spirit of ancestors - Hapram ko bongas.

The Jom-Sim Bongas.

Tutelary spirits of Santal Ojhas - Saket Bongas.

Hindu deities - Deko bongas.

Boundary Spirits - Sima bongas.

Mountain & hill spirits - Rongo Ruji bongas.

Village Outskirts spirits - Bahre bongas.

Water Spirits - Baghut bongas.

Santhals hold a deep belief in their bongas, their connection with bongas is so deep that they believe themselves to be completely ruled by them and are believed to be omnipresent. Any event, no matter how important, plays a role for bongas. Traditionally, in primitive times, Santas had no bongas; The concept of Bongas worship was introduced into the Santal religion in a later period when Santal ancestors were wandering with many difficulties. The place of worship can be indoors or out in the yard.

5.7.1 Socio- Cultural aspects of sohrae festival:

Sohrae is the most important annual Sandalwood festival, usually celebrated for the five days. During this festival, they not only worship the Bongas (gods) but also the spirits of the deceased ancestors (Hapramko). In addition, they summarize the events of their past days in many ways. Sohrae was celebrated in Morang district during the Kali Puja ceremony. Before the sohrae festival, the Santals try to decorate their homes in manyways. For this purpose, they cleaned and leveled the walls and Raca (yard) using pickled cow dung, trying to paint new colors on the exterior walls. Some types of temporary architecture as well as fibrous signs and symbols associated with this festival are as follows:

Ground structure in the Gor Tandi (a plain land where the first worshipping is being done), Cooking place in Gor Tandi,

Furuks (leaf plates),

Manjhithan,

Manasa Than,

Target

Ground structure in Gor Tandi

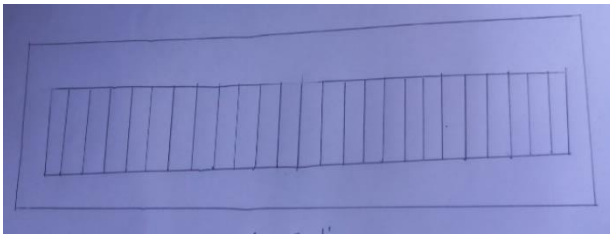


Figure 44: Gor Tandi

Gor tandi is a place of worship on the first day of the Sohrae festival. That is bare land, the land after harvest, where the rice stalks are left. The trunk is cut in some parts. The ground in this place is leveled using a mower (a half cutter) and the herbs are picked. So a 1.5 X 1 square foot place is cleared for worship. It is considered as sacred place or God. Then, water is poured over it to flatten and further soak. After that, Naeke (priest) sat for final preparation facing east. Sun-dried rice flour is spread from north to south in the center of this square. To the east, another line of this type is prepared. The sun-dried rice bush is scattered in the middle in successive lines from east to west connecting the first lines made. Thus, a total of 23 blocks are prepared, called Khonts. It can vary from 17 to 25, but is always odd according to the number of gods offered for sacrifice in the respective villages.

Each block (Khont) represents a Bonga. The names of the local Bongas in each village will be different. Then in each block, Methi dust is dispersed at the east and west ends. Then, Sindur Sunum (Sindur - vermilion, a ceremonial red dye, Sunum - mustard oil) is applied on it. In the middle of each line, a point of Sindur is given. The dried rice is spread evenly on top. Then a bird is taken. Sindur and Methi get stuck on top and he is fed rice sun-dried from the northern polar block. His neck was then cut by a helicopter to be sacrificed to Sin Bonga. So the north polar block is prepared for Sin Bonga (God of the Sun). This form of sacrifice is called Sim Bongayea (sacrificing Sim or poultry with a knife cut by cutting the throat on behalf of Bongas). The blood from the neck drips onto the block, then presses the head on it and throws the body away. This bird comes from Naekeharam's house. Another chicken, taken from

Naekeharam's house, was sacrificed on Marangburu's behalf and its head was placed on the next block. Poultry collected from villagers are sacrificed on behalf of different Bongas and placed on the remaining blocks. This worship and sacrifice is done for the safety and security of the villagers, their prosperity, healthy and wealthy life, bountiful crops, and peace in the village. In each sacrifice, Naekeharam, Manjhiharam, Kudam Naeke and Jogmanjhi say "Bandhna/Sohrae started, they worshiped Bongas and sacrificed to go through a life of peace, safety, security, health and wealth and If their prayer is answered then they will play it. Again, next year". Sohrae Nitum also takes place in Gor Tandi on the afternoon of the first day. Half an egg is buried on the ground where the Bongas sect used to take place in the morning. The egg is glued with vermilion. Cows, Cows, Calves of each family are left on the ground. Then these animals ran across the ground here and there. It is believed that the animal that touches or smells the egg will be a lucky person and its owner will also be a lucky person. Both of these structures are temporary in nature.

Cooking for Gor Tandi

Santal prepares Khituri (mixture) on the first day of Sohrae festival beside Gor Tandi and eat food prepared there. On the fourth day, both men and women use it for cooking. They dug a floor one and a half square meters wide. It is one and a half feet (1/2) feet wide by. It is a temporary creation used on sacred occasions.

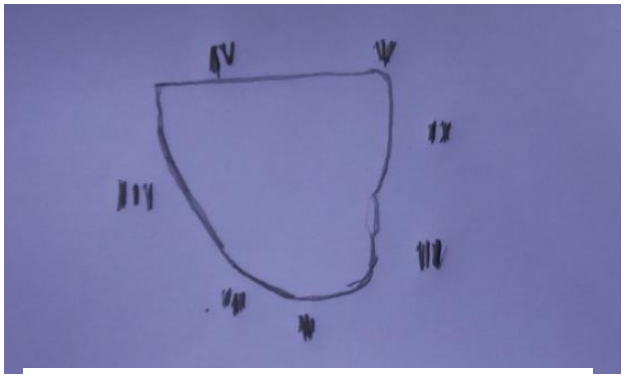


Figure 45: cooking place in Gor Tandi

Furuk

These are pots of sal leaves and palm leaves.

The smooth surface of the Sal leaf is kept as the inner surface of the pot, and the rough surface of the leaf is kept as the outer surface of the pot. The two side corners are folded down. The ends and sides of the plate are attached to the folded sides by means of ribs. First, both sides are folded. The apex was then bent and held outside the lower ends of the lateral fold, and tied with leaf veins. Thus, the pot of leaves (Sal Furuk) has been prepared. It is used to give Handi to Bongas and drink Handi after offering as a favor from Bongas. On the other hand, Furuk made of palm leaves is used to drink Handi. They usually drink it in such Furuks recalling the fact that their ancestors used to drink tapioca leaf water. Palm leaves are prepared in the same way as snacks and prepared. These two materials may be classified in heading fibrous building materials.

Manjithan

It is a non-aquatic, square-shaped permanent clay structure with or without a vertical rear. It measures 3 feet long and 3 feet wide with a height of 6 inches. It consists of clay. On its back there is an almost triangular crest, also made of earth indicating the back of the royal chair. It has an extension. This extension measuring 1.5 x 1.5 x 0.5 cubic feet and also made of clay, was used as a seat for Manjhiharam, when he sat down to worship. The form of Manjhithan may be different in nature in different villages, but it must be observed in each of Santal's colonies. Manjhithan is the place to worship Manjhi Bonga or Manjhiharam Bonga (the spirits of the Manjhiharams who died in the village.

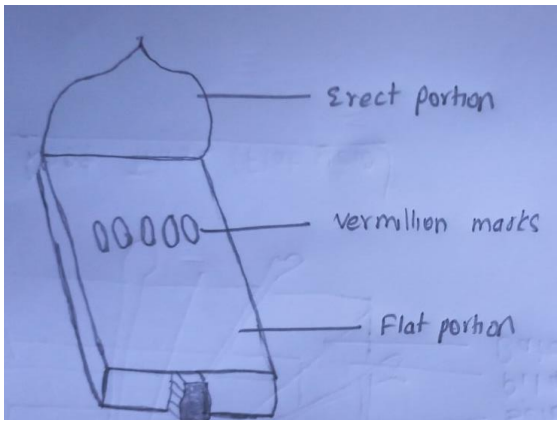


Figure 46 : Manjhithan

Mansa Than

It is also a permanent iconic structure, square in shape. It is placed in the eastern part of the courtyard under a tree Champak (of the Mangolia family). It is a structure 4 feet long and 4 feet wide. At the lower end of the tree is an earthen vase representing the goddess, Manasa. A phallic symbol of Siva is placed to the left of the pot, and the other half is buried under God to the right of the pot. Mango leaves are placed on the ground pillar. This is not the same feature of every Santal village. There may be different local deities and their places of worship.

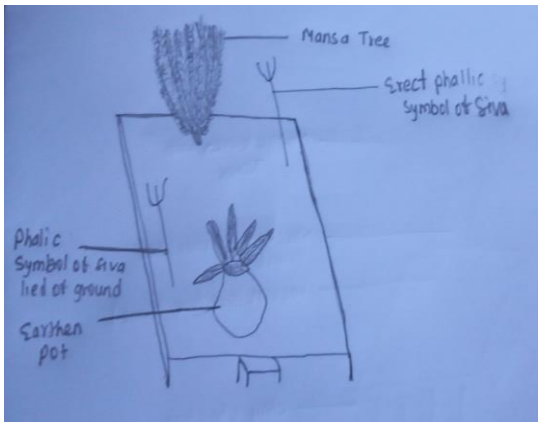


Figure 47: Mansa Than

Target

The target stem is cylindrical in shape. The candy held on it is flat and round. Goal or the practice of Bejhatui is the final event of the Sohrae festival. A small hole was dug there and buried about two inches of the cut papaya stem. This trunk can be Verenda tree or Banana tree. Then worship Manjhiharam and Jogmanjhi there. Here worship is done by Jogmanjhi under the supervision of Manjhiharam. At the beginning, three red lipstick marks are given on the trunk. Then using the index and middle fingers of his right hand,

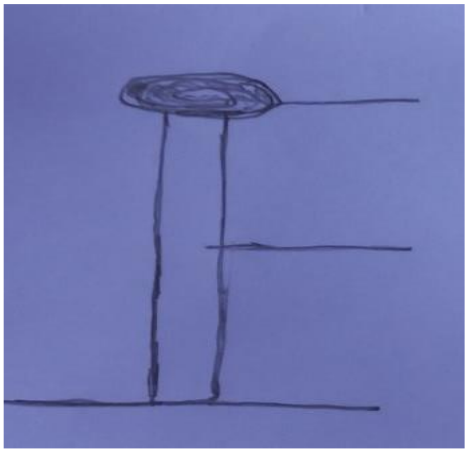


Figure 48 : Target

Jogmanjhi placed three red lipstick marks on the ground. Then five Furuks were made of Sal leaves. Jogmanjhi sat facing east. This worship was performed in in the name of Bhagoot Bonga, who lived in the forest. It was offered by Handi by various Furuks for five times. Before doing so, in each case, he washes his hands, then gives the Handi of Furuks and prays that "This festival is over, Bonga keep them healthy and rich; it will happen again. in the next year". This is evident in each case after the Handi offer. Then they prostrated themselves as a sign of obedience to Bonga. Then a flat candy made of wheat is placed on the stem as a target. About 50 yards west of the target, a wooden stick was buried in the ground. Manjhiharam targets first the target, then the other villagers. In the end, one of the hit the target. His arrow hits the tree trunk and the target falls to the ground. Another run towards it to get it and the runner, who takes it, treats it as a reward and eats it. The man who succeeds in targeting is considered the best target of the current year and he is put on the shoulders of the villagers and thus returned to the village.

Baha

The semantic architectural forms associated with Baha are few. Villagers take a ritual bath on the eve of Baha Day. The next day, they observed Baha Pujas at Jaher Than. The next day, Doljatra day of the Hindus in Bengal, they like to throw water, just like the Bengali custom of throwing colored water during the Doljatra period. The second most important annual sandalwood festival is Baha. Before the celebration, they often attempt to cover their homes with fresh rice straw, during or after the Magh festival, sweep of their homes with pickled cow dung and sometimes plaster and decorate the walls with colors. In accordance with the requirements of the chapter, here I will describe the symbolic architectural forms connected with Baha

Mandoa

Mandoa is the prestigious non-permanent fibro-constructed structure seen in a wedding ceremony. Mandoa was built when the father of an unmarried girl was able to spend the full amount of expenses in one the wedding. The cult of Bongas is observed in his marriage to Mandoa. The Sunum Sasan (turmeric oil) ceremony also takes place next to Mandoa. In the yard or the back part of the houses of the respective families, several pits are dug. Next, a Matkom (Mahua tree) trunk two feet long and a Sarjom (Sal tree) trunk equivalent in height were tied with wire and buried under a hole one foot deep. Then it was covered with clay and a cubic structure was prepared. This is called Mandoa Khun

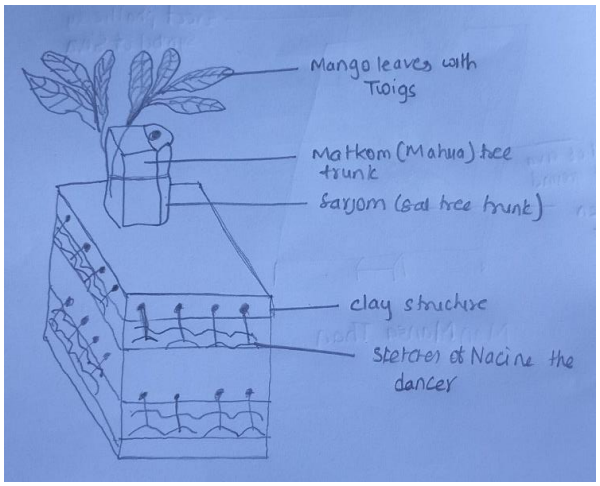


Figure 49: Mandoa Khunti

Table 3: Comparison of case study

Parameters	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Result
Picture								
Occupation	Hunting	Hunting – agriculture	Agriculture	Teacher	Head of dancer	Village head Present viewing rituals	House of christian	Occupation and social status differentiate the structure of house
Planning	Single room structure	Single room structure	Courtyard planning	Courtyard planning	Large frontal space	Courtyard planning	Passage system	Prevalence of courtyard planning for multiple use like farming and ritual
Kitchen/ Shed	Outer space	Outer space	Separate structure	Separate structure	Kitchen same Separate structure for shed	Separate structure	Used earlier structure	Separate structure due to ritual belief
Material	Bamboo, leaves	Bamboo, leaves, mud	Mud, bamboo	Mud, bamboo	Cement structures	Cement structures	Concrete RCC structures	Earlier mud architecture changing to concrete due to easy availability
Roof	Bamboo, leaves	straw	Thatch roof	CGI sheet	CGI sheet	CGI sheet	Concrete flat roof	Earlier thatch roof changing to CGI sheet due to easy availability
opening(window)	no	no	Very small	Moderate	large	moderate	large	Increasing in size due to require of bright interior
Verandah	No such space	No such space	Present viewing rituals	Present viewing rituals	Present viewing rituals	Present viewing rituals	Small space is left	Present for viewing rituals

5.8 Construction process

Construction of mud house of Santhal

The construction of a new hut is divided into two sections. The first phase is Orak Duor Banao, or house construction, and the second half is transcendental, or strengthening the house via ritual activities to appease Bongas (spirit - gods, ancestral spirit, etc.)

Principles of construction of a mud-built house consist nine steps which are as follow:

a) Orak Dinde Bachnau: Selection of piece of land for construction of hut.
b) Song and Rehet: Measurement and planning.
c) Hasa Bachnau: Selection of soil.
d) Hasa Jawa: Preparation of soil.
e) Kanth Banao: Construction of wall.
f) Orak Korao: Construction of roof truss.
g) Orak Dab: Thatching.
h) Finishing by levelling of walls and decoration
i) Maintenance of house

5.8.1 Selection of piece of land

Inside a Santal agreement, land is occupied by means of the Santal dwellers of the village. each time a brand-new Santal circle of relative's approach to construct a residence within the village, if land may be provided by using the villagers, some inhabitants of the village show them land for constructing a house. commonly, family of the present dwellers come for this cause and that they generally build their homes the usage of their family' belongings and this is being carried out to overcome some negative condition in his previous village. but, while a newcomer identifies a land to put together his hut, he ought to ask for permission of the Manjhiharam (headman) of the respective village. If he permits, then the newcomer Santal may additionally start the construction. After of completion of the development of the residence they perform a Puja (worshipping) and offer a banquet to different villagers. through this he and his circle of relatives have become the legitimized settler of the village. construction is started out at the start of wintry weather from the month of October and ends inside the month of may also of the following yr. however bad monetary circumstance and non-availability of constructional implements because of lack of cash occasionally enlarge the timing of construction for two to 3 years. however, constructional work is accomplished only for the duration of the dry season.

5.8.2 Measurement and planning

The word "Song" means "plan and measure" and the word "Rehet La" means "plan and measure".“Digging” of foundation (Gorot Kotan) believes Santal to be the power of tree trunks depends on how deep it is rooted under the surface. They are watching this storm and cyclone (Hoi Bhaddu) cannot knock down trees with deep roots. From this hands-on experience they build a hut. The deep base and wide walls add durability so, they dig deeper and wider burrows (Rehet Khandrin Doro – “Rehet” means groove, “Khandrin” –depth and draw-width). There are different units of measurement for each unit of measurement. About length (girin), width (osser or dolo), height and depth (candrin), volume and density (gavau) Dolly), using the following units of measure: For uniform measurement of all units, they are considering a person who is neither too big (Odi Usul) nor too small (Gadra) medium height (Usur).

Different Traditional measurement unit of santhal are as follow:

a) Katoop: The width of the finger and used to measure very small distances on the ground or at altitude.

(b) Poa: Thumb height and used to measure small waist circumference.

(c) Animal: the distance between the thumb and middle finger in the straightened state. It is also used to measure small lengths.

(d) Talah Moka: distance between elbow and wrist. It's about a foot in length and widely used.

(e) Mocha: It takes about a hand or a foot and a half to get from the elbow to the tip of the middle finger of the hand. This has a lot of usage.

(f) Te: Arm length, distance between shoulder and middle finger. It's less used for the most part

Arpa: When the arms are extended, the distance between the ends of two middle fingers. It is the largest unit and is used when preparing the wire.

(h) Ghunti: The foot-to-knee height of a medium-sized male. It is used to measure depth.

Bulu: Height of the foot to mid-thigh. It is also used to measure depth.

(j) Danda: Height from foot to waist. It is also used to measure depth.

(k) Koram: height of legs to chest level. It is used to measure depth.

(l) Hatla: Height of feet to height of armpits. It is used to measure depth and is maximum depth unit.

For traditional way of measurement at first, a rope is taken and measured by hand; length, width, depth, etc. fixed. The length (Jiling) is fixed in odd numbers, i.e., nine Moka (nine hands), eleven Moka (eleven hands) or thirteen Moka (thirteen hands) etc. It is placed in odd numbers because it is believed to be auspicious. But the selection of such odd numbers helps them to accurately determine the necessary midpoints for the house construction. However, there is no such belief regarding width (Osar), volume (Gava), depth (Khandrin) etc. They can be set to odd or even numbers. When measuring the length, Steam and height are fixed on a rope, then eight rods are attached to it indicating the length and width. Four rods indicate the length and width of the internal volume of the nail. The remaining four indicate the outside volume of the foundation. Subtracting two sets gives the width of communication. It is called Rehet Osar, it is the width of the foundation and is two to three times larger the width of the chamber wall (Orak Kanth Osar). They determine the depth of the foundation and often hold two to three times the height of the room. Today we see that a house (Bin Kotha Orak) is under construction with foundations from 2.5 meters deep. Then they dig floor. They get the correct depth using a measured rope and measuring rods which they hold on four sides of the foundation. Then they decided on Kanth's height. The height of a class when they are lying on the ground is Kanth's height. It is fixed at Bar Te or Bar Moka or Bar Talah Moka or two Te or two Moka or two Talah Moka. Soil or Rehet Osar (foundation width) is dug and filled off the foundation by using soil, which is done on this hollow place.

Total land area in a Girdo = 10 Kathas

Also, Bargi = 7 Kathas

For the hut = 3 Kathas

Measurement of 3 Kathas at home on domestic land

1. Outside Chopri: 3 hands x 11 hands = 6 Gondas

2. Hall of Gitic Orak: 6 hands x 11 hands = 10 Gondas

3. Calapindo: 3 hands x 11 hands = 6 Gondas

4. Outside Calapindo: 3 hands x 11 hands = 6 Gondas

5. Raca: 12 hands x 16 hands = 12 Gondas

6. Dakae Orak: 3 hands x 4 hands = 3 Gondas

Guest room (Gitic Orak): 6 hands x 11 hands = 10 Gondas

8. Stability: 6 hands x 11 hands = 10 Gondas

Thus, the total amount comes to 63 Gondas, i.e., 3 Kathas 3 Gondas.

Among the traditional units 20 Gondas = 1 Katha

1 Gonda = 0.05 Katha = 0.1 decimal = 0.001 acre.

5.8.3 Soil selection

It is believed by the Santal that strength of a tree trunk depends upon how far it is rooted deep under the surface. They observe that storm or cyclone cannot demolish a deep-rooted tree. From this practical experience, they build their hut with deep foundation and broad walls which make it more durable. Therefore, they dig a deeper and broader hole for construction They have distinct measurement units for different items of measurement. For length (Jiling), breadth (Osar or Doro), height and depth (Khandrin), volume and density (Gava and Dorie.

They decide the depth of the foundation and generally keep two to three times the height of the room. Nowadays, it is found that a house is being built with a foundation of two to two and a half feet depth. After that they dig the soil. They get the exact depth by help of measured rope and the measuring sticks they keep on four sides of the foundation. Then they decide the height. The soil Osar (width of foundation) is dug out and laying out of foundation using soil, is done on that hollow place. The Santal do not consider how far space is necessary for living for one person when they construct a hut. Rather they think how much thatching material they could provide on the roof and as per the supply of thatching materials they construct a large or a small room. The expert persons among the Santal who built huts professionally is also found in village. Even they have expertise in different parts of house building. For example, some are experts in wall construction, some in making roof truss and thatching. Again, somebodies are expert in thatching by paddy straws, while some others in thatching by tiles or tins or asbestos. All of them are the Santal. Therefore, the person who wants to build a hut calls for the experts if he is not an expert of this kind. The owner shares the idea and planning and the experts do according to their plan.

soil selection: The Santal of are familiar with different kinds of soil. Of these some are utilized for construction work. Typology of Soil according to the Santal conception is given below:

a) Sandy soil
b) Fuller's earth, used as shampoo by the Santal
c) Reddish soil, very soft and smooth
d) White soil, available in agricultural field
e) Red soil
f) Gravels soil
g) Stone hard soil
h) Saline / Salty soil
i) Muddy soil.

The Santal are aware of the availability of different kinds of soil in their locality. The different kinds of soil used in different constructional work during building of home. For construction of wall sandy soil, gravels soil and ordinary muddy soil are mixed with water in equal proportion, that is, 1: 1 :1. For drawing pictures on wall; red soil, white soil and natural colors

derived from forest grown plants are used. For maintenance or reddish soil, soaked cow dung and black ash derived from burnt straw are taken in equal proportion and mixed with sufficient water.

5.8.4 Preparation of soil:

At first, a big hole is dug beside the land where a new hut is to be constructed. Different types of soil which are necessary in different levels of construction are brought from different parts in the locality and are kept in that hole. Then sufficient water is added to it and two to three persons start the work of soil preparation.

The procedure:

a) At first sandy soil, gravels soil and ordinary muddy soil are brought together within the hole where soil preparation is being done in equal proportion (1:1:1). Then sufficient water as per the quantity of soil demands is added to it. Then it is chopped by a spade. After that this is pounded with legs.
b) During this time dust of burnt straw are mixed with soil. As a result, termites cannot make termite hill on the soil.
c) To strengthen the soil, husk of paddy is mixed with the soil mixture.
d) After pounding with legs, it is left for three to five days for proper mixing, which is called death of soil in Santali.
e) After three to five days, they again pour sufficient water (they are enough experienced about how much water is needed for what amount of soil) on that mixture. Then again it is chopped by a spade followed by pounding by legs.

Experiment of the properly prepared soil: A small part of prepared soil is taken and a ball; round, in shape, is made of it. Then it is kept in a large bowl full of water. Then the bowl is shaken. If it is observed that the prepared round ball of soil is dissolved into water, then it is inferred that the soil is not well prepared.

5.8.5 Construction of wall:

After completion of soil preparation, the soil is thoroughly stuffed into the hole made for foundation. The plinth height is kept high on the earth surface in the downstream of village road; while in the upstream it is kept lower on the surface. If height of the plinth is kept on the level of the earth surface in the upstream of the village road. In this way the rain water, which pass through the village road in a downward movement, cannot damage the huts beside it. After this construction of wall has been started. At first, it is determined what would be the wall height, that is, what would be the height of one layer. The width of wall is determined at the same time and it remains two to three times less than the width of the foundation. After determining the height and width of one wall, they prepare two measuring sticks one for keeping the exact wall height and the other for keeping exact wall width. By help of these two sticks they keep same height and width for each wall on four sides. After preparing and examining the soil to be used for construction, they make round ball of soil, which are called

Guli Hasa. Then it is kept on the upper surface of foundation. After that, they spray water on this and break this. Then it is compactly stuffed making a one layer of wall on four sides are constructed at a time. This is done to avoid ill-proportionate height and width of the wall. Furthermore, they apply a rope to maintain the exact length and breadth of the room, on its four sides. After doing construction of one wall in four sides, it is left for a few days for drying up. After it is completely dried, then they construct the next wall.

5.8.6 Construction of roof

- The basic structure of the roof is made up of sal tree and bamboo, similar to the structure of a wooden house.
- Sal logs over 15 cm thick are used for ridge beams, kingposts and main rafters.
- Common rafters and other support beams are made of bamboo that has been folded in two and nailed to a grid.
- Then the shadows of C.G.I sheet or hay are placed on top.
- Different design such as mouth of snake, elephant etc is made where rain water drops

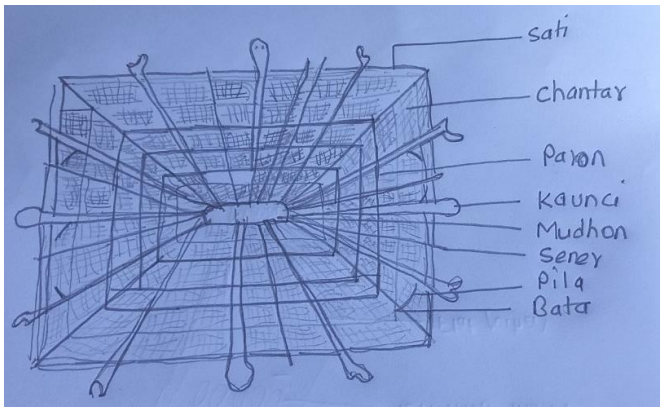


Figure 50: Roof truss

Different step carried in construction of roof truss:

a) Mudhon: The first step is to prepare the Mudhon or the center wood of roof truss. Mudhon wood is prepared according to the measures of Jiling (length) of the piece and can have three Mochas, five Mochas or seven Mocha, etc.one. Wood choices for Mudhon Dhela (Ankor), Wood Sarjom (Sal) or thick bamboo available on the hill side) is used for small roofs. The wood used for the Mudhon is pierced (Rok) in several places above both sides of it called Bindh compared to after making Rok (boring), Mudhon received a communication from Aynom(eye drops), Sindur (vermilion) and Sunum (oil). Then inside (Bhitre Mutule) the room, two long bamboo poles buried in the central area (Gava) of the room. The precise length of the Mudhon is the distance between the two poles. When deciding, measuring the height of the Mudhon is done with the help of a Dang (a long bamboo used as a measuring stick)

b) Kaunci: - Kaunci is wood, which is attached to the Bindh (hole) in Mudhon and is spread to Sati Wood outside the room. The length of Kaunci depends on the area of the room and the distance from the Sati. wood and Calapindo du Mudhon. The opening is a Jiling Mak (long bamboo pole) used to measure the length of Kaunci. The bamboo pole is cut to the length of the Kaunci and thus becomes a measuring stick (Dang). According to this length, the woods, which are used to make Kaunci, are cutwith exact length.

c) Sener: The wood which is placed inside two Kaunci wood is termed as Sener. It is spread from Mudhon to Sati and are tied with these two woods by ropes. This is narrower than Kaunci.
d)) Paron: The two Kaunci are vertically attached with the help of Paron wood. These are longer in length than the Mudhon and are spread on four sides of the room from one end to the other end.
e) Bata: Bamboo Bata wood is placed within two Paron wood, Carve bamboo poles one Bete or four Katoop apart. Bata wood is placed on Kaunci or Sener.
f) Chantar: If the bamboo branches used for Bata are placed four Katoop apart, then that (Dab) is implemented in this framework. Conversely, if Bata. wood placed at a distance, greater than four Katoop, then Ecek, Saparom (Sepali or Suli, a tree with fragrant white autumn flowers) wire; or in case not available, bamboo wire is used as Chantar. Chantar wood is placed on Bata. Sati: Usually Chalot (wide) wood is used for this, and they are placed on the four sides of the room in the outermost part. They are attached to the chamber use nails. Kaunci wood is paved on Sati wood. In general, mango wood used is Sati wood.
g) Pila: Generally, Guloncbahar, Kud (pink apple), Cuduc (black berry), Tali Rehet (root of fan palm) is used to make Pila. They are dressed in the shape of a plowshare (Nahel) and are kept underwater. Then the day of roof trusses, depending on the size of the Kaunci, with Kaunci attached on the inner wall with nails.
h) Binding (Tol): There are different types of bonds. Binding used in the hut works called Orak Tol. Orak Tol generally has three types

5.8.6.1 Thatching by straw

Two types of straw are used for roofing, viz. varieties with large straws and varieties with short straws. Large straws are of better quality than short straws. If a hut is roofed with large straw, then large straw is used in less quantity less than short straw. Therefore, a large straw is beneficial for both manners. Straw lining is done in two ways, viz. (a) Ati Te or Badha Chauno (using straw package) and (b) Lara Te or Tiipo or Khola Chauno (by opening the straw package). The layer of straw starts from the Sati end of the roof truss, that is, from the bottom to the top of the Mudhon, called the Tipe end. Tipe again comes in two varieties, viz. (a) Sujhi Tipe (top menu end) and (b) Galang Tipe (design of the upper part).

5.8.7 Construction of Door/ Window

When building the walls, there is space left for doors (Silpin) and windows (Jarla Baju) opened with Kaadapata. Once the walls are completed, the Kadapatas will be removed. Before, the doors are covered with date palm leaves and the windows are not made. Today, initially, wooden frames are placed on the openings for doors and windows. Then the wooden pair of the panels are fixed on the frame with screws. Hurka (wooden latch) is made to close the door and windows, which are fixed on the inside of doors and windows. The frame is called Deura

is in Santali and is made of wood from Sarjom (Sal), Ul (mango), Matkom (Mahua) and Wooden pair is made of jaggery or date palm.

- For construction of window and door, a certain amount of space is left open.
- Height of door is four to six feet; while of windows, one and a half feet.
- A wooden frame is used for keeping space for window and door during construction of walls.
- the frame of roof has been prepared that much of the height and width of door and window, and the top and bottom part of the frame is extended on each side to six inches.
- After setting the frame the wall beside it, is constructed

5.8.8 Construction of floor

- The mud floors of any Santal houses are as smooth as any modern house floors if maintained properly.
- To keep the floor smooth, it is needed to be coated with cow dung at least once per week

5.8.9 Maintenance of House

5.8.9.1 Mud plaster

- Plaster is essential to protect wall
- Village women apply a layer of a mixture of mud and cow dung to smooth the walls. The walls need at least 3-4 layers of mud to achieve a uniform surface for the first time.
- later, to take care of the wall, two layers of mud are enough to get the desired result. When the last coat is almost dry, rub the stones for a better finish.

5.8.9.2 Cow dung as a primer before paint:

- when the clay plaster is completely dry thin coat of cow dung apply like a primer before painting the walls.
- Without this layer smoothness of the wall is ruine
- Acts as a protective layer on the wall.
- The floor is elegantly finished by mixing cow dung and black clay.
- They also prepare black pigments by burning hay.

5.8.9.3 Coloring the wall:

- Natural color used in the whole process.
- The process of coloring the wall is done in two phase Jerer Hasa and Color (Patao).
- First, they dilute white clay (Kaolin Clay) with water and coat the wall using a piece of cloth.
- Two layers of white clay are put to get a perfect finish. Then they carve various designs on it with their fingers.

5.8.9.4 Jerer Hasa

Jerer Hasa or the red soft ground is taken three times and pickled cow dung (Gobor Guric) is collected once, then mix with water. Water is added to it in such a proportion, an earthy mixture created, neither too dry nor too liquid in nature. Women people apply it with a particular decorative purpose using a cloth, covered right palm. They move their hands horizontally and vertically. It takes a single woman five days to shed four walls and a floor. After when making this first Jerer, it was left to dry for two to three days. after it is drying, the second Jerer is made. After applying red earth to second Jerer, a piece of rock, with a flat surface, used for leveling wall and floor. It took more than five days. Again, this is left for more than two three days to dry. After that, Hende finished creating the base color for walls and floors. For Hende, burnt straw (Busu Sengel) is used to produce black (Hende). Busu Sengel and pickled cow dung are mix in a 1:1 ratio; then add a little water. After it is applied to floor and wall. For a woman, to make the Hende, it takes two days for the four walls and one day for the floor. Then it goes to four days to dry.

5.8.9.5 Color (Potao)

Color (Potao) is applied after hende's app to create the base color on the walls at the end Jerer people. But this is done only on the interior and exterior walls, not on the floor. Color begins at least four days after Hende ends. For Potao, the inside and outer surfaces of the walls are first painted white. Pond Hasa or Khori Mati (white soil) is collected from agricultural fields to produces a white color. It is then soaked in water for three to four days. It is then stirred and then filtered and a black and white concentrate is obtained the solution (color of the pond) is obtained from this. His concentration is tested spread some color on the walls. At first it is applied from the height of the column at the top of the outer and inner walls and this is applied horizontally and vertically. According to the following tune, it applies in the motorized wiper movement cars to create geometric curves. The fingertips are left open and a piece of cloth held in both fingers (mainly the index and middle fingers or sometimes on the index, middle and ring fingers) and staining is done by this piece of cloth. Females attach a large piece of tissue to their upper body arms to prevent color from flowing into their bodies, such as when holding finger up, the color can reach their leaky shoulder by hand. They apply this wider fabric on the upper arm to avoid this. If the outer wall is painted white, sometimes the inner wall or part of an exterior wall, usually the height of a column, or sometimes the whole wall from the clover to the roof, all are red. This red is available at mound or hill. It is called in Santali, Ara Hasa (red earth). Before application, it is mixed with soaked cow manure and water to form a dark red color. Sometimes blue is bought from the market and applied directly mix it with water to mark the height of the base.

5.8.10 Rituals for construction of traditional santhal mud house

This ritual is performed before the construction begins, i.e., before making Rehet La (excavation). As if to point out that this Bahre Bonga cannot be there and cannot damage people or huts, Guru performs rituals to pacify Bahre Bonga. Furthermore, particular etiquette

is maintained to test if the roof frame can support the hut, and chicken is offered to placate the Bongas after the completion of the building, before entering the freshly built hut, to reinforce the hut, make it durable, and strengthen Orak Bonga (guardian of the newly built hut). In addition, when making roof trusses during construction, some rituals are performed observed in the Mudhon Rakab to avoid an evil eye. Additionally, because they moved into a freshly constructed hut, the chief of the hut required them to make offerings to Orak Bongas, the hut's guardian spirit, and Hapramko Bongas, the spirit of deceased ancestors, once a year.

CHAPTER 6. FINDING AND DISCUSSION

6.1 Factor shaping the architecture

6.1.1 Social- Economic factors

Three types of unit clusters were identified based on occupation and family structure. Land ownership of a shared family home with enclosed private land. A large family with a common courtyard that is semi-closed and leased. A single unit cluster with a loosely defined common open space. The village mayor's unit is believed to be larger and better maintained than the other units. These show that the village mayor is highly financially stable. These homes are also uniquely made with colors and decorations. The low datum of the house is due to the preference for crouching willow trees. Here, the village mayor, Baguwan Shoren, lives in the beautiful cement house. The priest of the house is also taller and more beautiful than the other members.

6.1.2 Ecology

Ecology plays a major role in the design of settlements. The construction of Santal's house depends on the availability of natural ingredients. Santal usually builds settlements where proper soil is easily available and where dyes and materials for flattening walls and floors are readily available. Uses natural white and black tonal gradients Cow dung, shells, clay and bamboo are very convenient as they are readily available.

6.1.3 Education

It is seen that some elite or literate Santals, who get degrees up to graduate level and earn money form service in different kinds of offices they also have landed for cultivation, which is cultivated either by other members of his family or by members of his village), adopt some kinds of modern features. For example, their houses are well decorated and colored etc.; that is impact of modern education is traced by modernization in shaping their dwelling huts. The case of Hapna Soryen who use gas cylinder to cook rice in spite of wood.

6.1.4 Religion:

Due to availability of Christian Santals in field area, the impact of religion in shaping of a house or settlement in satar village. Most of Christian santals are literate which helps them to uplift their living standard. It also made them individualistic from communal life. They also start to build concrete structure with passage system of house.

6.1.5 Social aspects of santal architecture

The traditional santal village does not follow the typical courtyard home arrangement. Individual courtyards are interconnected to form a linear pattern of shared outdoor areas. This shared place evokes territorial and tribal identity. Composition and distribution of space the functional form demonstrates the logical properties of an agricultural civilization. Settlement components include linear yards for processing post-harvest crops, cow shelters, granaries, and

seed storage. Inclusion of related populations is represented through a huge semi-outdoor pavilion-like structure. Santals civilization is an excellent illustration of how social structure and values may interact. Because they value community life over individual existence. The family's form plan is influenced by the basic notion of a community. Santal village has alternative dwelling plans, square courtyards, compact residences for nuclear families, and building orientations.

6.1.6 Cultural aspects of Santal architecture

Indigenous peoples' traditional knowledge systems are an essential cultural feature of all ethnic groupings. The ethnic community has retained its understanding over the years. They founded their cultural practices in cultural expression. Folk architecture is a storehouse of traditional knowledge from a specific ethnic community with cultural values. Its folk practices, material culture, and artistic expression have all been maintained. Few ethnic groups throughout the world have created design documents. The architectural handbook is significant from a literary standpoint since it offers several unique building categories. The courtyard is particularly significant because it provides a distinct cultural character to the neighborhood. Throughout the year, the courtyard serves as a venue for many people to study and practice performing arts such as dancing, singing, and community theater. This is a community-based school for religion and artisan instruction. Santhal home Shape is a great place to find both concrete and intangible cultural worth.

6.1.7 House as religion symbol

An essential aspect of vernacular architecture is its socioreligious significance. Here the santal tribe's universal deity belief first evolved. the architecture's design and purpose. a straightforward form with plenty of room in a semi-outdoor area. Humanitarian size, light and air, and removal of superfluous details are transformational truthfulness, practicality of form and space The figurative representation of the object represents the perfect depiction of a rural existence. Additionally, domestic objects in the Santal culture are closely related to spiritual convictions. According to prehistoric faiths, the deity resides in each santal dwelling. Therefore, designing a home must include a designated space, ideally a corner, for worshiping the family's deities. It is traditional to construct a Punga, a tiny fire pit. to smoke within the home's courtyard. It is thought that other materials, like the shell and the Wealth Goddess, should retain fire. As a result, the house developed into an outward manifestation of ritualistic behavior and spiritual beliefs. Modern home planning does not incorporate these aspects, but construction is still an integral component of it. For instance, ceremonies are still scheduled for later calling. Explain how Santal's identity was influenced by social, cultural, and religious factors. in their well-liked method of architecture. Therefore, a designated space, ideally a corner, for observing the family's deities, a necessary component of home preparation.

Table 4: Social aspects role in santal architecture

Aspects	Values/ Custom/ Belief	Spatial pattern
Social Aspects	Community identity Age	A compact house is formed near the water resources. Different painting in santal architecture Courtyard planning
	Family values	Community spaces define a sense of place which represented santhal community
	Age & Gender	Compact planning
	Social Identity	Age-specific seating is available on the verandah.
	Social interaction	Dedicated Women's Space on the Verandah Courtyard Planning
	Order and discipline	Outdoor, semi-outdoor, and inside space hierarchy Linear and central spaces

Table 5: Cultural aspects role in santal architecture

Aspects	Values/ Custom/ Belief	Spatial pattern
Cultural Aspects	Traditional knowledge system	Traditional Santhal house shape as a symbol Interior decoration. • Focus on performance space. Space for handicrafts, painting • Agricultural elements such as cow sheds, Granary •
	Cultural Practices	Open courtyard spaces function for dance, handicrafts.
	Cultural education	Construction techniques goes from generation to generation
	Crafts making	Vernacular construction Technique emphasizes the richness of the language culture.

Table 6: Environment aspects role in santal architecture

Aspects	Values/ Custom/ Belief	Spatial pattern
Environment Aspects	Land utilization	Compact Settlement plan • Compact budget planning • Mud floor • Enough outdoor space •
	Passive Thermal solution	Walls made of mud plaster
	Ventilation & wind flow	Small windows on the gable side for ventilation
	Earthquake resilience	Lightweight walls • Single-story structure • Thick mud wall to support lateral loads
	Natural lighting	Orientation for maximization of the natural light
	Water and green	Large and extensive sloped roof for preventing precipitation Large semi-outdoor area for managing driving rain. •Green plants on the outskirts to stop erosion
	Consumption of resources	Multi functionalism of space Use of regionally relevant materials Shared resource and space concept.
	Addition to geography	Adapted to the geography of flat land.
	Sanitation Consideration	Natural propensity towards cleanliness Exterior bathroom and restroom

6.1.8 Changing Trend in Architecture

Santhal architecture start with cave. As settlement increase, they started to live in small cottage After which they prefer Jhanti Orak made up of Bamboo stick and leaves which reflect nomadic lives. Kumbha orak afterwards is more stable small structure made up of Bamboo, small stick and also use of mud plastering is started thatched with hay they find better location and started to live over there. Now present-day mud architecture of santal consists comparatively larger structure which is plaster with mixture of cow dung, Husk, Mud but with no proper ventilation. Separate structure for kitchen, animal shed is built which is thatched with straw. Now prevalence of concrete structure is also somewhat being seen in Santhal village. House for

example house of Hapna Soren is made up of concrete structure thatching material replaced to CGI sheet comparatively more ventilations is provided. Concrete Homemade of cement and Brickv but thatching material is still CGI sheet and proper ventilations is provided and sufficient space is created spade applying little water to it and pounded by legs and retested. Then construction of a next wall is done. Thus, it takes a minimum of three days" time for construction of one wall. It takes at least six persons" labor of whom, two remain engaged in preparation of soil, two in placing the soil and other two in measuring.

6.1.9 Santhal mud architecture

Through years of experience and knowledge, Santals has developed mud house structures from simple treehouses to two-story mud houses. These homes are simple yet elegant and require minimal investment, so even a family without a steady source of income can build them. This clay house for over 40 years. The walls and floors of the house are smooth and nearly 14 feet high. It was one of amazing structure develop by their ancestors. The only downside to these mud houses is that they require annual care and maintenance. So, in holiday, all the women in the village are busy with mud to take care of their homes. The mud house of a santal residence is formed of wattle and daub, in which a woven net of wood strips called wattle is coated with a binder substance often composed of damp soil, clay, sand, animal dung, and straw. Opening is made by leaving it open. The continuous maintenance is done by plastering with cow dung and straw and further painting is done for both decoration and maintenance.

Table 7: Changing trends in santhal architecture

S.N.	Changing Trends		
	Component	Cause	Effect
1.	Construction Technique	Difference in material structure	• Shortage of timber • Changing market with availability of new types of building material
	Spatial Organization	Increase in number of rooms>> increase site area Semi- closed house	Require more privacy
	Materials	Wall Use of concrete blocks and brick	• Modernization • Shortage of Timber and Bamboo • Changing market with availability of new types of building material
		Window Glazing	Preference for bright interiors and proper ventilation
		Roof: Use of corrugated CGI sheets	• 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
		Wall Decoration	• Due to youth not showing interest in this work busy on own schedules • Less knowledge • Shortage of skill Labor

CHAPTER 7. CONCLUSION AND RECOMMENDATION

7.1 Conclusion

Santhal is indigenous community which have own vernacular architecture. Santhal consist of own unique culture that shapes their architecture. Vernacular architecture aids in the exploration of the mutual relationship between people and things while also reconnoitering material culture studies, consumerism, and environmental psychology, all of which are immutable characteristics of a society (Price 1989). Santhal has its own culture, traditions, and way of life. This uniqueness is evident, among other things, in the way they build and decorate their homes, which all demonstrate their skilled craftsmanship. Santals are regarded as skilled home builders among other tribal societies. A Santal home is not just utilized for residential reasons, but it is also designed to be multi-functional. Their architecture engages the social, environmental, religious, cosmological, and feeling of communality while also displaying the aesthetic and practical appreciation of their traditions.

Cultural and other attributes Etros plays a major role in using all human society space. In other words, it is a cultural space like bhitar inside room and several spaces outside courtyard space is allocated for some ritual to be carried out. This cultural idiom is the most important in the category in santhal architecture. While in the urban sector, spaces are minimal and people have minimal access to use locations for private freedom. Nevertheless, the smallest room should have at least some of the cultural ecrus. Tribal companies are seen compared to other rural societies. Similarly, the presence of verandah, courtyard space both interior and outer reflects both cultural and social importance. As these spaces is use as social interaction spaces between people community. They also perform different rituals like marriage. This is quite vulnerable to such resource abuse, and sometimes leads extinct from these communities. And where the strength of the present study lies in the systematic understanding of the culture that underlies the use of space in the form of the creation of houses and settlements. Existing Model will help to understand similar issues among other communities in other parts of the country, among all rural people and help them prepare appropriate plans as the recovery progresses be done for changing architecture.

Most of the traditional house is made of mud with C.G.I sheet but in modern context house are made up of RCC structure with C.G.I sheet or Flat roof. But due to modernization and urbanization the pattern of santhal architecture has been changing. The traditional mud house is changing to modern RCC structures. It shows that it not only diminishes form of architecture but also diminishes identity. Modernization led to build the house of concrete pattern of settlement has change from colonial to individualistic society. Understanding of different attributes like social cultural attributes in order to understanding their identity is very essential. Due to the loss of traditional knowledge brought on by machinery, modern materials, and construction technology, local craftsmen are in high demand, and young people and the following generation are not inheriting ancestor knowledge, which has resulted in the complete eradication of some techniques and rituals related to the built environment. People's social and cultural values are directly impacted by changes in the built environment. In certain ethnic groups, a person's home symbolizes their social standing: the village chief's home is identified

by more details and a bigger floor plan description. These qualities have been destroyed through modifications to traditional and indigenous elements. The perspectives, lifestyles, and native shapes and designs of people are represented in houses. Thus, proper rules and regulation have to be developed to preserve vernacular architecture of santhali people. The rules and regulation have to be made in such way that enhance the livability of community and preserve their form of architecture. The material uses in modern materials used most resembles traditional form and architecture. Such as use of tiles in roof, abode wall, stabilized mud bricks etc. Such a model would be extremely helpful in finding a lasting solution, as the culture and worldview of the community would be a primary concern in developing such an alternative. for displaced populations.

7.2 Recommendation

The proper rules and regulation have to be developed to preserve vernacular architecture of santhali people. The rules and regulation have to be made in such way that enhance the livability of community and preserve their form of architecture.

To save the santhal architecture its core planning should not be diminished such as residential house should consist of verandah space to carry multiple function like social interaction and rituals carring space. Each interior of the house should consist of space like bhitar to worship local spirit. Each house should consist of courtyard space for multiple purpose which resembles identity of santhal architecture.

The material uses in modern materials used most resembles traditional form and architecture. Such as use of tiles in roof, abode wall, stabilized mud bricks etc. Such a model would be extremely helpful in finding a lasting solution, as the culture and worldview of the community would be a primary concern in developing such an alternative for displaced populations.

The ratuamai municipality also should give priority to enhance vernacular santhal architecture which preserve indigenous material and technology also culture and art of santhali people by providing financial and technical support

Furthermore, as the "indigenous" and traditional wisdom of the Nepali communities will be used to obtain an architectural solution, it will contribute to the sustainable development of the people and the creation of creating such a facility will also be profitable and ecological. Furthermore, current research has shown that with a minimum resource base of, the people of Santal can gain maximum profit building their homes and settlements by conserving the ecosystem and it describes the traditional wisdom involved, which will also be useful in planning alternative development in which the community is a part of that development. Therefore, the present study will contribute to "Western", "scientific" research.

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ANNEX

Questionnaires form for thesis

What is your name? (Name)

Are you the owner of the house?

- ○ Yes
- ○ No

Respondent details

Location: Province…….

Municipality/Rural Municipality…….

Ward……

What is your age?

- ○ Less than 10
- ○ 10-19
- ○ 20-29
- ○ 30-39
- ○ 40- 49
- ○ 50-59
- ○ More than 60

What is your gender?

- ○ Male
- ○ Female

What is your household size?

- ○ 1-2
- ○ 3-4
- ○ 5-6
- ○ 7-8
- ○ 9 and above

What family type do you live in?

- ○ Nuclear
- ○ Joint

How many children (13 and below) are there in household?

- ○ 1-2
- ○ 3-4
- ○ 5 and above

- None

How many elderly people (60 and above) are there in the household?

- 1-2
- 3-4
- 5 and above
- None

What is your occupation?

- Student
- Business
- Farming
- Private job
- Government official
- Others

How many members of the family are involved in economic activity?

- 1-2
- 3-4
- More than 4

What is your monthly income of your family?

- 15,000 or less
- 15,001 - 25,000
- 25,001 - 50,000
- 50, 001- 75,000
- 75,001 - 1,00,000
- 1,00,001 0r above

What is your religion?

- Munda
- Christian
- Hindu
- Others

What is your status in village council?

- Majhi
- Paranik
- Jog majhi
- Jog paranik

- Nayake
- Kudum Nayake
- Godeth
- Members

Building Information

What is the type of building use?

- Residential
- Residential cum commercial
- Rental

How many stories is the house?

- 1
- 2
- 3
- 4
- More than 4

What is the land area of your house?

- Less than 6 dhur
- 6 dhur to 9 dhur
- 9 dhur to 15 dhur
- 15 dhur to 20 dhur
- More than 20 dhur

What is the plinth area of the building?

- Less than 200 sq.ft
- 201- 501 sq.ft
- 501-1000 sq.ft
- More than 1000 sq.ft

What is the orientation of building?

- East
- West
- North
- South

What sides are set back on?

- East

- West
- North
- South

What is the width of street directly accessible from your house?

- Less than 5ft
- 6- 10ft
- 11 - 20ft
- More than 20 ft

Do you have following open spaces in your land plot?

- Front yard
- Garden
- Backyard
- None

What is the material used in construction of houses?

- Mud and bamboo
- cement and brick
- Bamboo and cement
- Others

What is the roofing material of your house?

- Thatch/ straw
- Galvanized iron
- Tile / slate
- RCC
- Other

Do all the rooms have natural ventilation?

- Yes
- No

How often do you use the courtyard for activities during the days?

- Morning
- Afternoon
- Evening
- Night

What kind of activities the courtyard used for?

- ○ Social gatherings
- ○ Performing rituals
- ○ Cooking space
- ○ Dining space
- ○ Washing utensils
- ○ Drying grains and clothes
- ○ Sleeping space

Changing Trends Information

How is the building has been changing?

- ○ Materials only
- ○ Structure only
- ○ Changes with preserving vernacular architecture
- ○ Complete change
- ○ None

What do you think about the importance of vernacular santhal architecture?

- ○ Very important
- ○ Important
- ○ Neutral/Average
- ○ Not important at all

What is the reason behind the changes in santhali architecture?

- ○ Changes due to materials
- ○ Changes due to climatic conditions
- ○ Changes due to climatic conditions
- ○ Changes due to policies
- ○ Changes due to market
- ○ Changes due to individual economic status
- ○ Changes due to social status
- ○ Others (specify)

Would you like to demolish your santhal house?

- ○ Yes
- ○ No
- ○ No idea

What do you think about the conservation of santhal architecture in the village?

- ○ All should be conserved
- ○ Some of them should be conserved
- ○ There is no need to conserve
- ○ Others (specify)

How do you think about the new constructions in the neighborhood?

- ○ They should not be more than vernacular houses
- ○ The number of concrete houses should be limited
- ○ Owners can construct as much as they want
- ○ All the houses should be concrete
- ○ Others (specify)

If you are constructing a new house in neighborhood, how it would be look like?

- ○ House with a vernacular construction technique and facade
- ○ House with modern construction techniques and vernacular facade
- ○ Low- rise reinforced concrete building with modern facade
- ○ House- rise reinforced concrete building with modern facade
- ○ Others (Specify)

Do you think the impact of new houses on the environment should be considered?

- ○ Yes
- ○ I have no idea
- ○ No

What is the level of knowledge of santhali language?

- ○ can speak, read and write
- ○ can read and speak only
- ○ can understand only
- ○ Neither understand, speak, read and write

What is the level of desire for Wearing traditional dress?

- ○ Like to wear all time
- ○ Likes to wear in the festival times
- ○ Like to wear only modern dress

Do you have any recommendations for preserving the village identity to future design?

……

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Changing pattern in Santhal Architecture: Case of satar village Morang

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Abstract
Nepal is poor and developing country but rich in cultural context. The Santhal is one of indigenous community with rich in cultural practices. Due to result of modernization Santhal identity are diminishing so study on this vernacular architecture is essential. Thus, detail study of architecture of Santhal architecture is needed in order find out the different attributes like social, cultural that shapes their architecture and changing pattern of architecture. As it can be seen that the houses in this locality are changing from green to grey it not only diminishes architecture but also kills the social cultural practices which ultimately result to diminishes of their identity. It shows the necessity of study in this topic as study of vernacular architecture focus on use of local materials and resources, which are relatively energy efficient and sustainable so study of this architecture is very essential, as exploration on this architecture is very limited in Nepal. This study sought to examine the changing pattern of Santhal architecture of satar village of Morang district both from primary as well as secondary source. The results of this study show that the traditional Santhal houses are changing from temporary structure with single room dwelling to today's modern RCC structure. The most of Santhal traditional house is based on courtyard planning the courtyard is used for several socio- cultural and religious purpose. Similarly, verandah spaces are present in every house for multi-functional use. The change from public space to private space also stems from the culture and customs of these regions. Thus, it can be concluded that Santhal architecture has been changing from cave dwelling to today's modern RCC structure. Thus, integrate study of such vernacular architecture is very essentials.

Keywords
Modernization, Santhal architecture, Courtyard planning,Transformations,Vernacular architecture

1. Introduction

Nepal has various buildings practices across its vast and diverse geographical area. They are rapidly changing in relation to the built environment due to globalization and urbanization and the tremendous growth of modern building techniques and systems [2]. Considering these changes caused by economic conditions and social obligations, we need to understand the concept of indigenous architecture and its transformation. The most important factors driving transformation are changes and advancements in technology, telecommunications, industry, and political scenarios. All these aspects influence the economic and social development of individuals and lead to changes in the built environment. In colloquial discourse, the terms change and continuation are constantly being considered and questioned. More recently, it has been observed that transformations have occurred that have led to the inappropriate use of locally available materials, sometimes leading to the global building materials and construction techniques. It is also important to note that indigenous settlements are also changing as they witness socially, culturally, economically, and the political context [6]. However, the current need for understanding and native observation means adjusting for changes to ensure continuity. Processes and factors leading to these changes are of primary interest and a good indicator for studies on Change. Needless to say, there have been obvious changes in the physical properties of spaces built in indigenous regions of Nepal. They are influenced by society, culture, economy, and political changes [4]. Nepal is made up of diverse identities based on religion and caste system. Different groups consist of their own native architecture, which also reflects their identity. Among them, the Santhal or Satar community is a unique ethnic group in eastern Nepal. Despite having a small population of just 0.19 % of the country's total population, they have a rich

culture and hunting habits.Thus the study focus on changing pattern of santhal architecture and social, cultural and environment role behind its changes.

2. Methodology

The research was carried out using case study methodology. Paradigm used post positivist paradigm to examine the changing pattern of santhal architecture which consist of both qualitative and quantitative analysis.Observation was carried out at site for quantitative method while for the qualitative method, photographs and maps were studied. The research use to measure the people's opinion, and the direct observation method for interpretation of their transformation. The primary data is collected through direct observation, unstructured questionnaire and interviews. The secondary data through report, article, book, magazine etc.

3. Study area: Satar village Morang

Morang district is located in the province No.1 in the east of Nepal. This is a district of Outer Terai. It is bordered by Bihar, India to the south, Jhapa to the east, Dhankuta and Panchthar to the north, and Sunsari to the west. Morang has one metropolitan city (Biratnagar), eight municipalities and eight rural municipalities. Morang is the central industrial area of the eastern region of Nepal. The primary survey was conducted in Santar Village, Ratwamai-6, Morang, Nepal. It is located 23 km south of Urlabari Morang and 1km from sauntha chowk. It is just 100m inside from main highway. For the study 7 different house of satar gaau is chosen based on materials and social status.

3.1 History

The history of permanent settlement is related to the myth of Santal's origin. According to the records of mythology of the tribe by colonial anthropologists, the tradition of Santals is traced back to their origin from a wild goose created by God which laid two eggs. From those eggs sprang Pilchu Haram (male) and PilchuBurhi (female) born and lived in jungle cave. They gave birth to seven boys and eight girls. As they grew old boys approached girls they got married as their parents also thinking of increasing population. But todays Santhal community don't accept marriage between same clan. The Population of santhal raised so they had to build a house as it is very difficult to adjust in cave [1]. Then primitive house Jhenti Orak and Kumbha Orak were prepared clearing the jungle (tandi) for temporary residence made of a wooden stick and the leaves of either palmilla or date palm leaves. Later started to built, mud huts for permanent settlement. The first record of Santal settlements was found in the Chotanagpur plateau from where they migrated to different countries [8].

3.2 House and Settlement

Santal people usually live in separate villages arranged in a street pattern, each with 50 to 100 inhabitants. Separate villages are preferred, but different groups may live more or less separately in the vicinity of mixed village or town tribes or sub-castes. Most of the settlements are located near to water resources where they perform different rituals. The settlements near the main streets are organized in linear patterns. Therefore, their houses are built on both sides of the street. Santal's house are never isolated because they intend to live in groups [7].

3.3 Varieties of Santhal dwelling studied from past to present context

3.3.1 Cave dwelling:

When the number of Santals is less, they lived in caves (Dandhor) or on tree trunks and hunt and collect their food from forest.As the population began to grow, the caves became insufficient for habitation, so the santhals began to build shelters from trees.

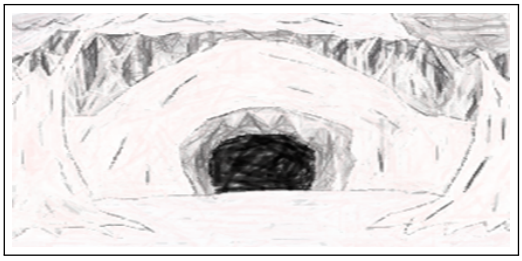

Figure 1: Cave dwelling of santhal

3.3.2 Cottage

Cottage is primitive building form, which erected across agricultural grounds to keep grains safe. Cottage is built for a temporary settlement purpose which is most primitive form of settlement structure. It is now prepared beside agricultural land for crop protection, as well as temporary dwelling before the construction of permanent hut. It is built in a very straightforward manner. Two bamboo poles are buried on two sides at first which is known as as Khunti. The entrance to the hut are called flutter. All of these poles are tied tightly with rope. Then, on both sides of this structure, use palm leaves or rice straw [5].

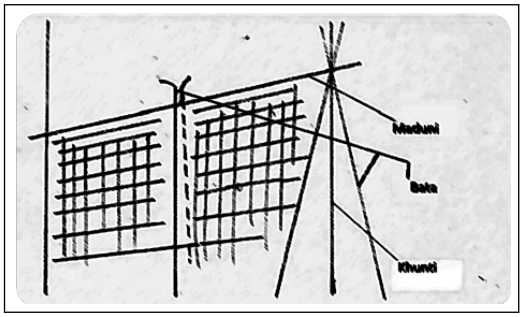

Figure 2: Santhal Cottage dwelling

3.3.3 Jhanti Orak

Jhanti orak is the primitive santhal house which is rarely found in present scenario. But still in certain area it is used as grains store or animal sheds. Jhanti orak is entirely made of bamboo stalks with narrow entrance and no openings, as it consists of ventilation through the walls. It has the shape of a cube. Generally, four trunks of Matcom (Mahua) or bamboo are buried in the four corners. These trunks are then connected by bamboo stalks at the top and tied together with ropes or fibers made from tree stalks or verbena leaves. Another bamboo trunk is tied to the central part. Jhanti orak was built for temporary purpose. It is also called Sakam Orak (hut from leaf). The width of Jhanti orak is 13 feet and the length of 6 feet. The interior of the house is used for sleeping and storage purpose. Cooking is done outward in open space. There is no sanitation and drainage systems in huts. The space is so small that families can hardly afford to stay in a hut. In general, male members sleep outside the hut and female members sleep inside the hut [9]. As the santhal people worship natural resources rather than the idol of god small area in interior is separated for worshipping.

Figure 3: Santhal Jhanti Orak

3.3.4 Kumba Orak

Kumba turned out to be the next type of structure developed by the Santals. It was built with better and sturdier building materials such as mud, grass mixed with murom (gravel) and Sal logs or bamboo poles used for columns and beams. One side of the structure is held higher to form a simple pitched roof. Kumba has the best force to dry up the wrath of nature. This change coincides with community towards a less nomadic and strated to maintain community village life. Today it is still prevailing as temporary house to stay before making permanent structure [3].

Figure 4: Santhal Kumba Orak

3.3.5 Mud House with Thatch Roof

The most of mud house is of member of village council.The walls are made of mud plaster with cow dung, mud and husk. The roof consists of thatch roof of straw. Separate structure for animal shed, kitchen and sleeping. The interior of house consists of two room one -storage and bedroom next room with worshipping, storage and sleeping. Other separate structure is also built for the other animal like Dangra or Gei Gora for cowshed, Sukri Banda for pig etc. It lacks proper ventilation and lighting and found less in number. The small portion is separated in bedroom in order to create small worshiping area. Front verandah space is created as resting as well as socialization space in the community. The courtyard space to carry ritual and also gathering space.

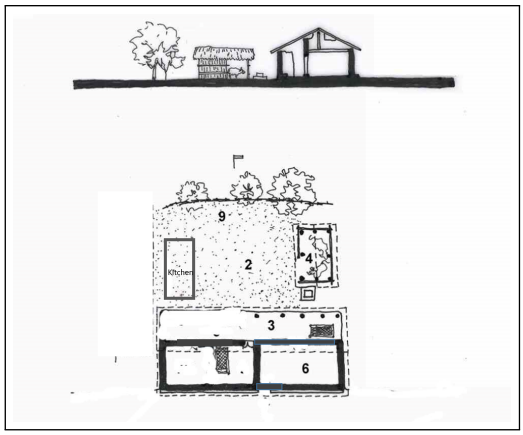

Figure 5: Mud house with Thatch roof

3.3.6 Mud House with C.G.I Sheet

The most house of santhal settlement in core village is made up of mud with C.G.I sheet. The walls consists of mud plaster with cow dung, mud and husk. The roof consists of CGI sheet in main house and thatch roof of straw in kitchen and animal shed. The small ventilation is created on verandah space which is use to view various ritual celebrated in village. Comparatively larger wooden window is used for lighting and ventilation purposes. The guest room is designed in outer verandah part. The Courtyard is used as place for performing various ritual and also socialization space. The small portion is separated in bedroom in order to create small worshiping area. The frontal verandah space is created as resting as well as socialization space in the community. The courtyard space to carry ritual and also gathering space.

Figure 6: Santhal mud house with CGI Sheet

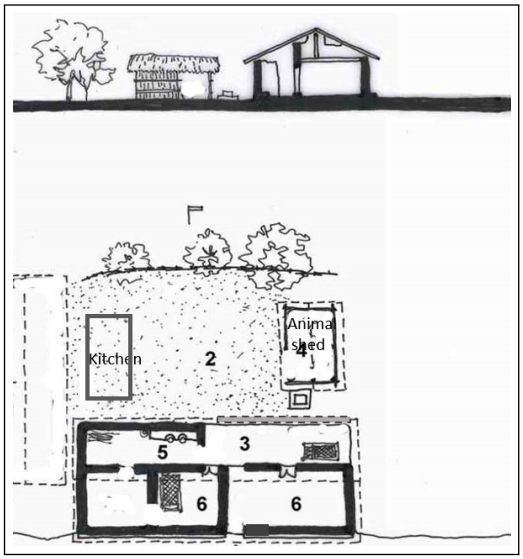

Figure 7: Plan of mud with CGI Sheet

3.3.7 RCC House with C.G.I Sheet Roof

The RCC house With C.G.I sheet roof consists larger rooms. The material use for construction of house is cement, Brick. It consists of courtyard planning, small mandap is presence in courtyard to perform various rituals such as birth ceremony, marriage ceremony etc. RCC structures consists of comparatively large window and ventilation. The frontal Verandah is used to view different rituals and also used as resting space. The interior of RCC structures consists of modern decoration. The small portion is separated in bedroom in order to create small worshiping area. Front verandah space is created as resting as well as socialization space in the community. The courtyard space to carry ritual and also gathering space. The head of village (majhi) house is also made of RCC structures his house also represents his status as his house is comparatively larger than other in santhal core settlement.

Figure 8: Santhal RCC house with CGI sheet

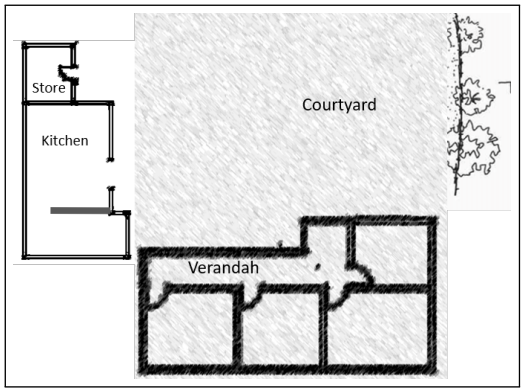

Figure 9: Santhal RCC house with CGI sheet

3.3.8 RCC Structure:Modern Houses

The modern house are basically made at outer core area. The house is made up of RCC frame structure. The house basically consist of one to two floors. The courtyard planning is absent in the modern house instead found passage system house. The house consist of more number of larger room with larger window for sufficient lighting and ventilation. There is no separate structure for the kitchen but consist of separate structure for the animal shelter. The small space in sleeping room is provided for worshipping god.

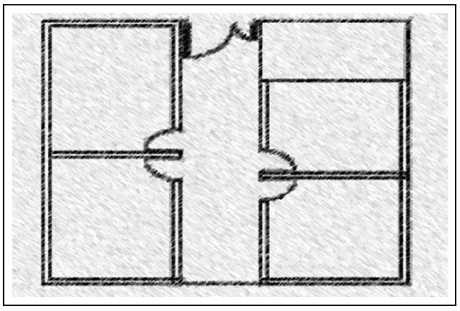

Figure 11: Plan of modern RCC Structures

4. Finding and Discussion

4.1 Reason for changing pattern architecture

4.1.1 Ecology

Ecology plays a major role in the design of settlements. The construction of Santal's house depends on the availability of natural ingredients. Santal usually builds settlements where proper soil is easily available and where dyes and materials for flattening walls and floors are readily available. Santhal uses natural white and black tonal gradients cow dung, shells, clay and bamboo as a building materials. But in present context the easy availability of such types of material is less which also the reason of change in material culture of santhal architecture.

4.1.2 Social aspects of santal architecture

The formation of the classic santal settlement does not follow the mainstream courtyard type house pattern. it consists of individual courtyards and forms a linear pattern of shared outdoor spaces. This common space conveys a sense of territorial and clan identity. Santals society are a good example of how social structure and values can influence architecture as they give more prioritize to social life than individual life. The shape plan of the family is inspired by the general concept of a community. However, in present scenario people started to focus on individualistic life than that of social life so they started to build bigger RCC modern house due to various reasons like increase in economic and educational status. Similarly, the change in religion is also the reason towards change in architecture.

Figure 10: RCC: Modern Structures

4.1.3 Cultural aspects of Santal architecture

The traditional knowledge system of indigenous peoples is an important cultural aspect of all ethnic groups. Over the years, the ethnic community has maintained their understanding. They rooted their cultural customs through cultural expression. It is preserved in its folk techniques, material culture and aesthetic expression. Courtyard is very important in santhal architecture as it gives a unique cultural identity in community. Throughout the year, courtyard is a place of learning and practice for different people, performing arts such as dance, singing, and community theater. This is, Community-based for religious and craft training. Santhal house Shape is an excellent source of both tangible and intangible cultural value. But due to youth of santhal decrease in interest towards own culture and costumes they start to build house without following the protocol of santhal architecture.

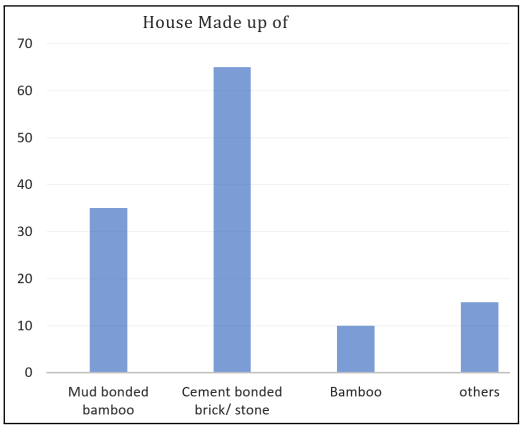

Figure 12: Building materials of santhal dwelling

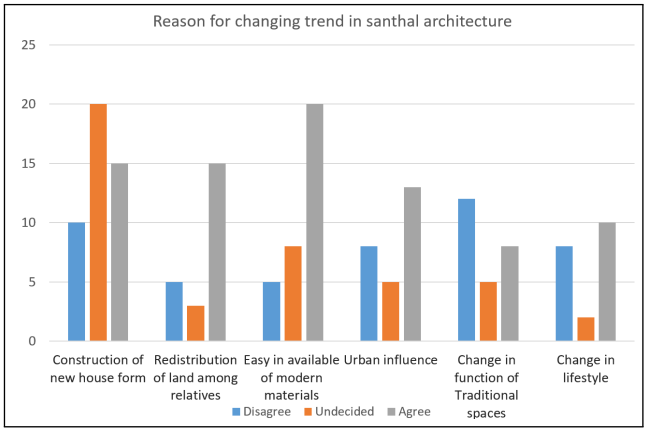

Figure 13: Changing trends in santhal architecture

As graph shows most of the house in Santhal architecture in present context is made up of cement concrete RCC structures. The main reasons for the changing trends of vernacular Santhal architecture is easy availability of modern material.

Table 1: Social aspects of santhal dwelling

Aspects	Values/ Custom/ Belief	Spatial pattern	Changing pattern and reason
Social aspects	Community identity Age	A compact house is formed near the water resources. • Different painting in santal architecture • Courtyard planning	Decreasing the size of courtyard, absence of painting in RCC structures due to youth having less knowledge of their culture and tradition
	Family values	Sense of territory defined by community spaces bounded number of trees	Lack of trees for modernization
	Age and Gender	Compact planning	Scattered planning as people moving towards individualistic society
	Social Identity	Dedicated sitting position for elderly, women on the verandah	Absence of verandah in modern structure
	Order and discipline	Outdoor, semi-outdoor, and inside space hierarchy • Linear and central spaces	Started to build individual boundary spaces

Table 2: Environment aspects of santhal dwelling

Aspects	Values/ Custom/ Belief	Spatial pattern	Changing pattern and reason
Environment aspects	Land utilization	Compact Settlement plan • Mud floor, enough outdoor space	Scattered settlement pattern with lesser outdoor space Due to increase in value of land
	Passive Thermal solution	Walls made of mud plaster	Concrete structure due to decrease in availability of local material
	Ventilation and wind flow	Small windows on the gable side for ventilation	Larger window for cross ventilation and lighting
	Earthquake resilience	Lightweight walls • Single-story structure • Thick mud wall to support lateral loads	RCC structures with multiple storied construction to follow present protocols Due to heavy weight less earthquake resilience structures
	Natural lighting	Smaller window for natural light	Larger window for lighter and ventilation
	Water and green	Large and extensive sloped roof for preventing precipitation • Large semi-outdoor area for managing driving rain. • Green plants on the outskirts to stop erosion	Flat roof in modern RCC structure
	Consumption of resources	Multi functionalism of space • Use of regionally relevant materials • Shared resource and space concept.	Less share space due to people move to more individualistic life

Table 3: Cultural aspects of santhal dwelling

Aspects	Values/ Custom/ Belief	Spatial pattern	Changing pattern and reason
Cultural aspects	Traditional knowledge system	Traditional Santhal house shape as a symbol • Focus on performance space. • Space for handicrafts, painting • Agricultural elements such as cow sheds, Granary	Due to less traditional knowledge system house lack performance space, space for handcrafts and no painting is seen in house.
	Cultural Practices	Open courtyard spaces function for dance, handicrafts.	People started to focus in individualistic life which diminishes faith to culture and religion so small or no courtyard space
	Cultural education	Construction techniques goes from generation to generation	Lack of knowledge of traditional construction to youth,pattern of house is changing
	Crafts making	Vernacular construction Technique emphasizes the richness of the language culture	Lack of such knowledge change the pattern of architecture

Table 4: Changing trends in santhal dwelling

S.N	Component	Cause	Effect
1	Construction Technique	Difference in material structure	• Shortage of timber • Changing market with availability of new types of building material
2	Spatial Organization	Increase in number of rooms increase site area Semi- closed house	Require more privacy
3	Material	Wall: Use of concrete blocks and brick	• Modernization • Shortage of Timber and Bamboo • Changing market with availability of new types of building material
		Window Glazing	Preference for bright interiors and proper ventilation
		Roof: Use of corrugated CGI sheets	• 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
		Wall Decoration	• Due to youth not showing interest in this work busy on own schedules • Less knowledge • Shortage of skill Labor

5. Conclusion

Santhal is indigenous community which have own vernacular architecture. Santhal consist of own unique culture that shapes their architecture consists of own culture, customs, traditions, and way of living. Among many other things uniqueness is demonstrated in the manner they construct and embellish their homes, which collectively showcase their expert workmanship. Their architecture engages with the social, environmental, religious, cosmological, and feeling of community while also displaying an appreciation for their traditions' aesthetics and practicality. But due to modernization and urbanization the pattern of santhal architecture has been changing. The traditional mud house is changing to modern RCC structures. It shows that it not only diminishes form of architecture but also diminishes identity. Modernization led to build the house of concrete and also change settlment pattern from colonial to individualistic society. Understanding of different attributes like social cultural attributes in order to understanding their identity is very essential. Due to the loss of traditional knowledge brought on by machinery, modern materials, and construction technology, local craftsmen are in high demand, and young people are not inheriting ancestor knowledge, which result in the complete eradication of some techniques and rituals related to the built environment. People's social and cultural values are directly impacted by changes in the built environment. In certain ethnic groups, a person's home symbolizes their social standing: the village chief's home is identified by more details and a bigger floor plan description. These qualities have been destroyed through modifications to traditional and indigenous elements. The perspectives, lifestyles, and native shapes and designs of people are represented in houses. Thus, proper rules and regulation have to be developed to preserve vernacular architecture of santhal people. The rules and regulation have to be made in such way that enhance the livability of community and preserve their form of architecture. The material uses in modern house most resembles traditional form and architecture. Such as use of tiles in roof, abode wall, stabilized mud bricks etc. Such a model would be extremely helpful in finding a lasting solution, as the culture and worldview of the community would be a primary concern in developing such an alternative. Furthermore, as the "indigenous" and traditional wisdom of the Nepali communities will be used to obtain an architectural solution, it will contribute to the sustainable development of the people and the creating such a facility will also be profitable and ecological. Furthermore, current research has shown that with a minimum resource base of, the people of Santal can gain maximum profit building their homes and settlements by conserving the ecosystem and it describes the traditional wisdom involved, which will also be useful in planning alternative development in which the community is a part of that development.

Acknowledgments

The authors express their gratitude to all the helpful staff personalities of satar village Morang who have assisted in providing the various related documents and data. An immense thanks to the residents of satar village who spared their time for the survey of satar village.

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Date: October 10, 2022

To Whom It May Concern

This is to confirm that the paper titled "*Changing pattern in santhal architecture : Case of satar village Morang*" submitted by **Kanchan Bhattarai** with Conference ID **12093** has been accepted for presentation at the 12th IOE Graduate Conference being held in October 19 – 22, 2022 at Thapathali Campus, Kathmandu.

Khem Gyanwali, PhD
Convener,
12th IOE Graduate Conference