

Vernacular Architecture: Exploring the Architectural Characteristics and Changes in Traditional Settlements of Rana Tharu from Far Western Nepal

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Abstract:

Vernacular architecture and settlements are considered culturally meaningful, socially acceptable, locally harmonized, and ecologically sustainable. The traditional buildings seem to be more connected to the local places, environment, culture, indigenous technology and people. However, with the development of new technologies along with increase in population, replacement of these vernacular buildings and settlements has become a regular phenomenon in many of the nations including Nepal. In this regard, considering the case of vernacular buildings and settlements of Rana Tharu from far western region, this paper aims to (i) examine the characteristics of settlement pattern, house form, construction technology, materials and spaces in Rana Tharu settlements; and (ii) identify the changes and crucial factors behind the acceleration of such changes. The paper applies a qualitative approach through explanatory qualitative analysis for exploring the transformation in architectural style, settlement patterns, house forms, construction techniques, use of spaces, and community livelihoods in the Rana Tharu settlements. Field observations, key informant's interviews and informal discussion with locals were carried out. This research contributes in understanding the factors causing changes in traditional Rana Tharu buildings and settlement, and also highlights on significance of vernacular architecture and settlements.

Keywords: Vernacular Architecture, Settlements, Rana Tharu, FarWestern Nepal

1.0 Introduction

Nepal has diverse climatic zones resulting to the opportunity for diversity in architecture throughout the country. Vernacular architecture is the result of hundreds of years of optimization to provide a comfortable shelter in a local climate using available materials and known construction technologies (Bodach, Lang & Hamhaber, 2014). It is a type of local or regional architecture which uses traditional local materials and resources for its construction. It is closely connected to its context and is aware of the specific geographic and climatic features as well as cultural aspects of its surroundings, and is also

influenced largely by them. Vernacular architecture is unique to each community and locations and bear unique identity and authenticity. It is built to meet specific needs, accommodate the values, economy, and lifestyles of a specific culture (Oliver, 2006). Vernacular architecture also respects local conditions, highlighting its great sensitivity to the geographical context of the surroundings, including climate, vegetation, and topography. In the recent years, considering the bioclimatic significance of vernacular buildings, scholars examined and replicated ancient architectural approaches in the projects that aim at maximizing energy efficiency with passive noise and thermal control, while reducing CO₂ emissions to the environment (Ghisleni, 2020). Vernacular architecture represents the cultural identity of a certain ethnic group and becomes a tool for strengthening bond between the communities and its geographic location, fostering a sense of belonging to the space in which they live (Hall, 2006). The strongest point of vernacular architecture is the harmony between environment and buildings. Today, vernacular architecture is considered a model for sustainable architecture, and the strategies that are now the basis of sustainable construction are derived from aspects and characteristics of this type of architecture. Moreover, traditional buildings met the social, environmental, and functional needs of their residents.

Nepal is a multi-ethnic, multi-cultural, multi-religious and multi-lingual nation. Pluralism and diversity are its unique and notable features. The traditional art, architecture and culture have direct response upon the daily life style of the people, climatic and geographic condition, and strong religious beliefs and socio-economic condition. The art, architecture and culture are different for different ethnic communities in Nepal. Tharus are probably the oldest groups to inhabit the Terai of Nepal. Tharu settlements are found in tropical malarial areas and they are unique and exhibit cultural diversity and found in various groups such as Eastern Kochila, Western Kochila, Dangaura, Katharia, and Rana Tharus. Rana Tharus are found only in Kailali and Kanchanpur districts and differ from rest of the Tharu groups of Nepal in terms of house forms, dress, ornaments, language, and dialect, belief system and practices, folk art and crafts, facial and physical features. At a time of increasing globalization, the traditional architecture and settlements of many ethnic communities including Rana Tharu have undergone through several changes. The rapid increase in population and accelerating influx of people to the Terai region from the hilly region has threatened existing vernacular architecture and settlement structures of ethnic communities. In this context, considering the case of Rana Tharu architecture and settlements from Far Western Nepal, this study aims to examine the settlement pattern, house form, construction technology, materials and spaces in Rana Tharu settlements, and identify the changes and crucial factors behind the acceleration of such changes.

2.0 Study Approach and Methodology

This study is conducted in the settlements of Rana Tharus from Kailali and Kanchanpur districts in the Far Western Nepal. It has adopted qualitative approach using multiple techniques of data collection such as field study, participant observation, discussion with the residents and archival research. The field visit was conducted in January 2022 by the first author in the Rana Tharu settlements including (i) Kaluwapur Village of Kanchanpur (Raikbar Bichuwa); (ii) Naya Basti Village of Kanchanpur (Bhmdatt-16 and 14); (iii) Old Jugeda Village of Kailali (Dhangadi Sub-metropolitan City).

A preliminary survey of the settlements was conducted first with support of the local people specifically to understand the characteristics of the architecture, settlements and community. A detailed survey was

conducted by selecting typical buildings, public spaces, and community leaders. Author stayed in the village for a week and experiences the life style of Rana Tharus to understand local context, values, architecture, building materials, cultural activities and meaning of each elements of Rana Settlements. Measurement of specific buildings was carried out with support of local residents and sketches showing plans, elevations, sections and details of the buildings were prepared. Simialrly, archival research was conducted by reviewing various books, papers and reports about Rana Tharu architecture and culture. In addition to above settlements, other Rana Tharu settlements from Parau Village, Kalkatta Village, Parsia Village and Dekhatbhuli Village of Kanchanpur district and Urma-Urmi village of Kailali were also studied to explore the characteristics of architecture and settlements. The leaders of each community along with residents were interviewed purposively to investigate the methods of construction of buildings and understand the cultural meanings and values.

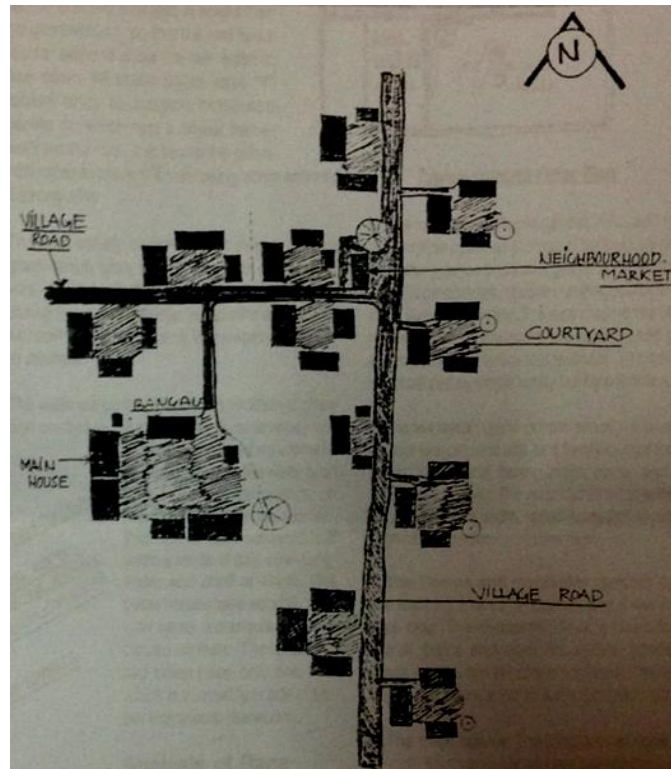
3.0 Results and Discussion

Rana Tharus present themselves with their own identity and they proudly claim Royal blood from the rules of Rajsthan. In particular, they claim that they belong to Maha Rana Pratap's family, a Kshatriya ruler group of Chitwad area of Rajsthan India. Social relation among Rana Tharu is based on community solidarity. They have their unique socio-cultural beliefs and practices; their kinship always strives to unite the people. Rana Tharus of Far Western Nepal exhibit their own cultural identity, life style, belief system, house form, architecture and settlements.

3.1 Rana Tharu Settlement Pattern

The Rana Tharu villages are generally scattered and often located at a distance of two or three miles from one another. These settlements are typically found on high land with proximity to the river or water supply safe from water logging and inundation during rainy season. In a traditional settlement, a narrow and unmetalled road (width fit for cart moving) runs through the village, on both side of the road the houses are arranged to form 'U' shaped courtyard. There is a common chowk, mostly at a nodal point, characterized by one or two shops, a *Pipal Chautara*, hand pump for drinking water and a sitting space which acts as a market place for Rana Tharus. In a village community, life presents a unique picture; a person is related to others by more than one kinship ties resulting from the blood and marriage relationship. This multiple relationship has not only wedded the villages together in social and ceremonial life but it has also stabilized the village society. A Rana Tharu village therefore represents a closely knit society, the units of which have developed a bond of fellowship and corporate life through mutual obligations and co-partnership.

Figure 1: Settlement Pattern of Rana Tharu Village



3.2 Rana Tharu House Form

Each Rana house with its field and a vegetable garden is a detached residence with a narrow or broad alley separating it from the adjacent houses. The main house must face the east to bring prosperity in the Rana Tharu family which the other directions of the house do not promise. The size of the house depends on the size of the family. The larger the family, bigger the house with greater number of *paies*, that is the partitions. Every house must consist of two partitions. The Rana Tharu house represents the ultimate example among the Tharu of successful adaptation to the local environment and climate. The Rana Tharu house is a one storey building with a mezzanine floor, where the living and sleeping quarters are on the ground floor and rice and other grains are stored on the mezzanine. As the family expands, additional houses are built to form a courtyard. Animal shelters and storage sheds complete the enclosure on the third side, while the fourth is left open to the finely designed and built village streets. The sides of the house which face the courtyard are wide open verandahs, often occupying more than half of the plan area.

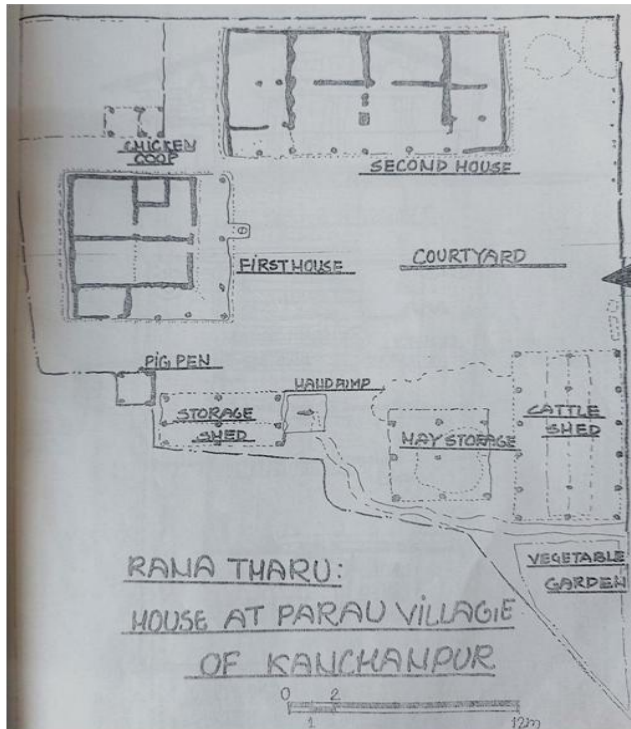


Figure 2: Rana Tharu House at Parau Village of Kanchanpur

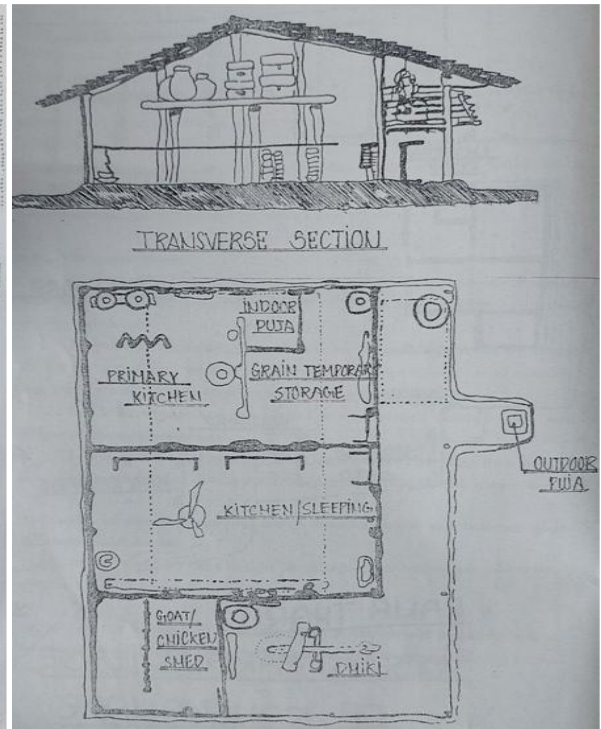


Figure 3: Ground Floor Plan and Sectional View of Main House

Figure 4: Mezzanine Floor Plan of Main House

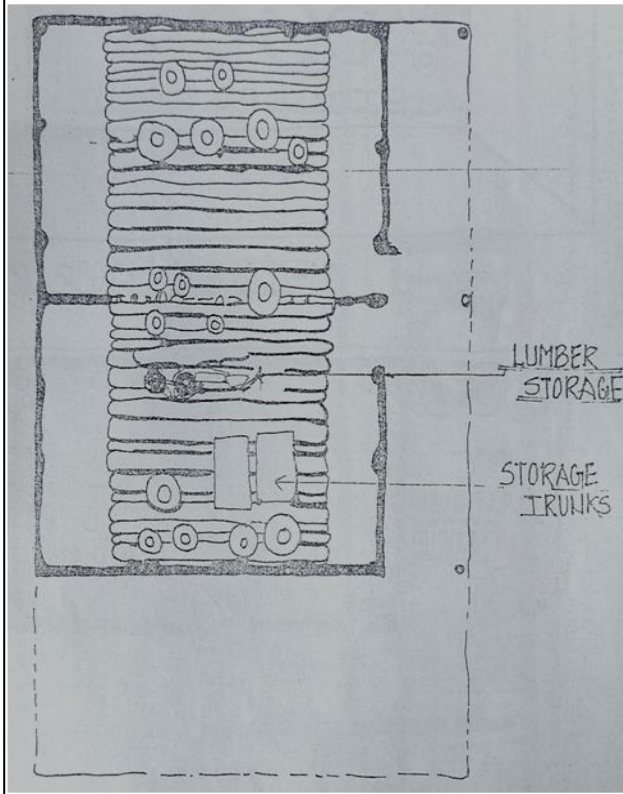
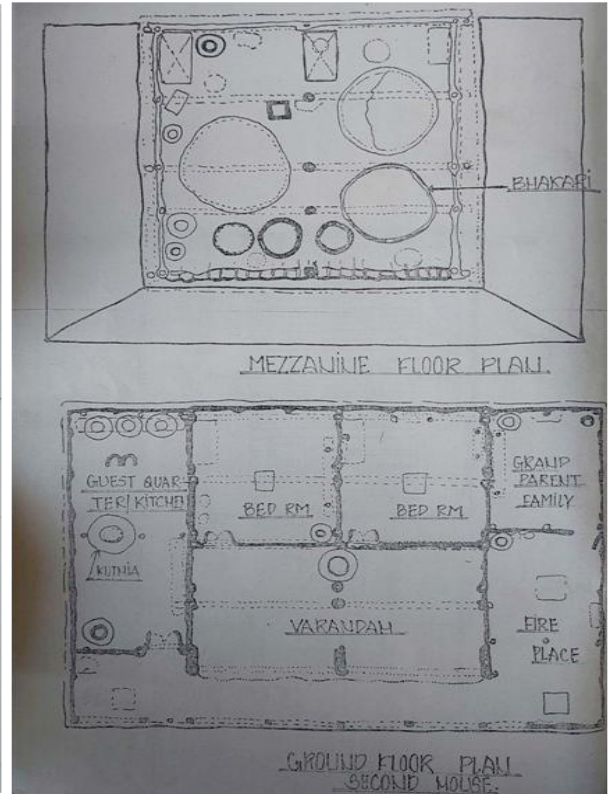


Figure 5: Ground Floor Plan and Mezzanine Floor Plan of Bangla House



The courtyard is the very heart of Rana Tharu family life; family activities take place under the open sky or beneath the eaves as weather and activities allow. Not only people gather here, but also dogs, goats and chickens. Bed frames are taken out into the open, where the men lounge and unmarried woman stitch their colorful, mirror-adorned skirts and blouses while the married ones nurse their babies. A house of two *paieshas* has four rooms. Each *paie* consists of two rooms without a wall separating them. Big earthen granaries known as *Kuthala* and *Kuthiya* serve as walls demarcating the partitions in the house into rooms. The inner rooms of traditional house are utilized for cooking meals and for installing household goods. No stranger may even enter this portion of the house. The outer parts are used for sleeping purposes. Each couple in the family is generally allotted one room.

The main house which has its roof projecting on both sides for 5 to 8 feet allows enough space keeping the rice husking machine and grinding stone. The fishing nets, empty pitches, other small agricultural tools and equipment hang on these projected roofs. In addition, every house has a verandah which opens out on a long courtyard. A small raised platform is built here for the household deities, such as *Durga* and *Nagrahi*. Outside the house on either side, there is usually a miniature orchard containing lemon, mango trees and also a vegetable garden; quite close to this garden a hand pump for drinking water is constructed. Every house has a *sar*, the cattle shed, at a distance of a few yards from the main house. There may be numbers of *sars* according to different species of cattle and their numbers. Adjacent to the *sars*, there may be store-houses for *bhusa* (wheat chaff) and fuel.

On either side of the main house, a *Bangala*, the rest house is usually constructed in the same style as the main house. The only difference is that it is closed on three sides and the front portion opens in the courtyard. Sometimes there are two or three partitions in the *Bangala*, which are used for sleeping purposes and for keeping some of the belongings of Rana family. Before the rainy season begins, they make minor repairs in their houses every year. However, most of the Rana Tharu families have now replaced their thatched roofs with *khaprahels* (baked earthen tiles) and recently with reinforced cement concrete (RCC) and Galvanized Iron (GI) sheets. Due to their contact with people of better standards of living they are also developing taste for artistic carving which decorates the doors and pillars of their houses.

3.3 Construction of Rana Tharu House

The Rana Tharus generally construct their houses in the month of April and May before the rains set in. On this occasion, *Bharra*, a religious leader, is consulted to find a suitable site for constructing a house. After the site has been selected, the *Bharra* offers *hom* to the gods and goddesses to remove the pollution of the place and drive out the evil spirits. The construction of a new house is a community affair with many neighbors and relatives participating in its construction. The house is constructed around a central pillar known as *Churi* which must be fixed at a depth of three feet in the ground and is 15 to 20 ft in the height above ground. In the same line three or four pillars of equal height are also fixed at an equal distance of 8 to 13 ft. All these pillars determine the length of the house and their numbers depends upon how many partitions are required in the house for a particular family. Two such pillars can make only one partition. For the breadth, the pillars known as *Chara*, *Chhota Chara*, *Agita* and *Tarawaha* or *Thuniya* are fixed in the ground one in front of the other and each one is two feet less in height than the one behind it, so that the roof has a regular slope to allow the rain water to flow down. All these pillars

have Y forked ends to support horizontally the beams on which rest a timber framework for the roof. It is tied to the pillars with ropes to prevent it from being blown away by a strong wind.

Figure 6: Joist Details

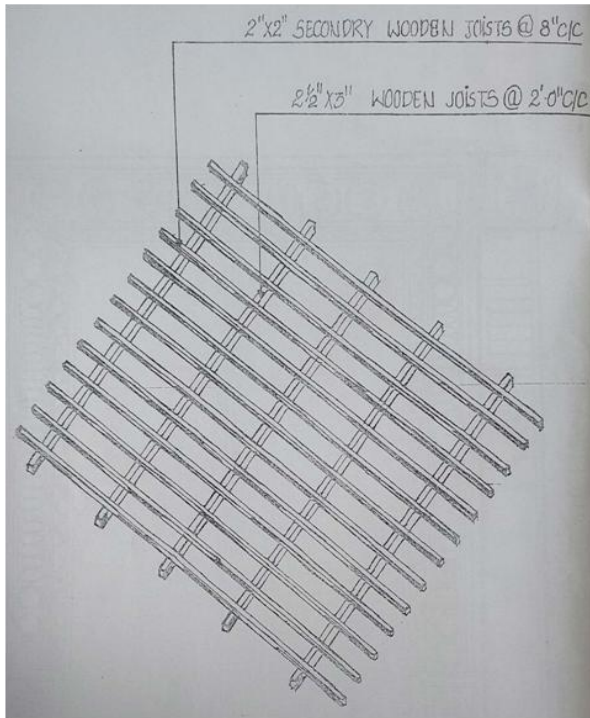


Figure 7: Beam and Column Details

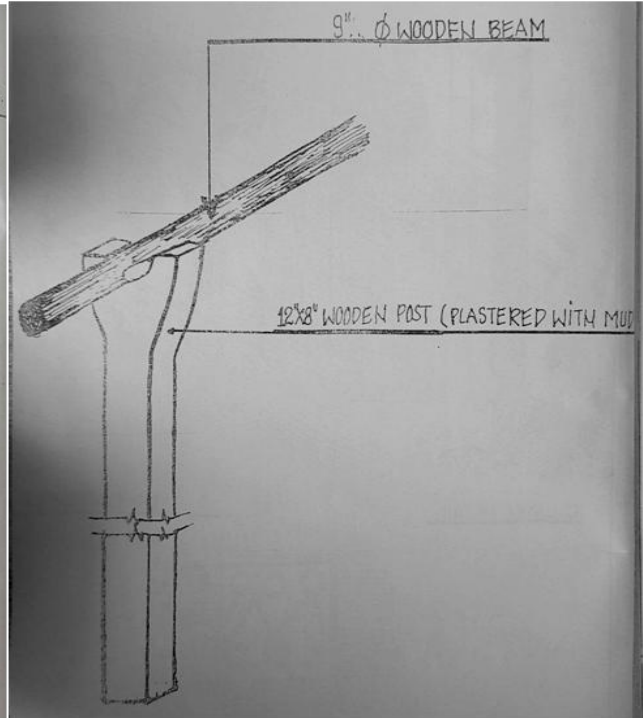


Figure 8: Details of Column and Wardrobe

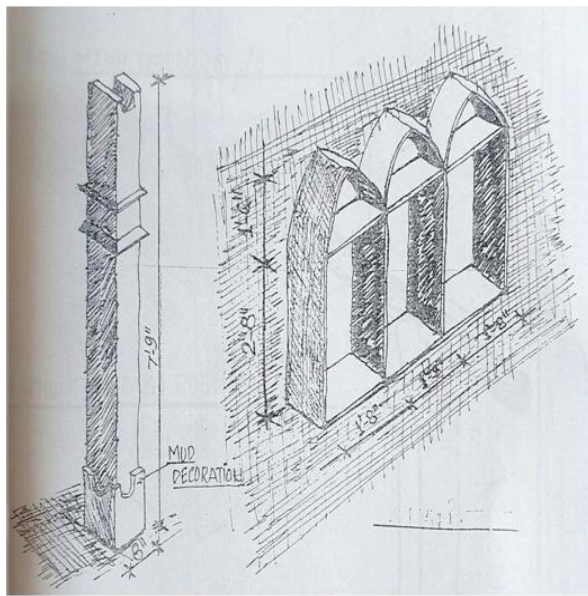
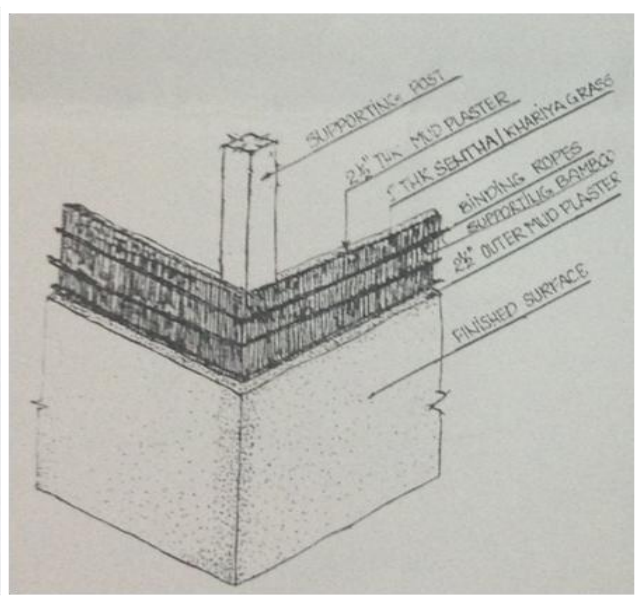


Figure 9: Construction Detailing of a Wall



The roof initially thatched with *bharaiorkans* grass which grow in abundance in the Terai. It was about 12 inches thick to prevent leakage during the rains. Later *khaprahels* are familiar for roofing purpose due to its durability and easy to maintain. The walls are built of *bhajari* or *tant* or *khariya* grass and are tied to the pillars with durable ropes and supported by bamboo element. The plastering of the walls is on

both sides and decorations on them are done by womenfolk. The home made plaster for the walls is made of clay, cow-dung, water and chaff of wheat. The better houses have wooden doors with some rectangular designs carved on them. The houses of two *paies* have only one door which is invariably made of timber framework (Salwood).

3.4 Discussion on the Rana Tharu House Form

The settlement pattern follows a certain rule such that the main house should face towards east and then U shaped courtyard is determined with respect to the main house. The village road connects every individual courtyard. The built structure of a house are not connected but there exists a specific gap between two structures which is appropriate to circulate air and useful in that hot climate of Terai. Some of the key inferences drawn from the analysis of the house form include: (i) shelter is of supreme importance to all people and the Rana Tharus evolved their own architectural style with the help of available local material and their knowledge of construction, struggling against the hot climate of Terai of Far western region; (ii) buildings are simple but environmentally sophisticated and possess strong connection with Rana Tharu life style and culture; (iii) and there is a hierarchy of spaces such as courtyard used as a public space, the verandah as a semi private space, and the rooms as private space. These are suitable to the hot climate of Terai region of Far Western Nepal.

The Rana Tharu Courtyard: It is used for various purposes such as storage of agricultural product; performing dance and social gatherings in feasts, festivals and ceremonies; playing area for children; and outdoor sleeping in summer time. The size of the typical courtyard may vary up to 50mX40m. Since, Rana Tharus are agro-based community celebrating various feasts and festivals; their houses cannot be isolated from the society as it presents a close relation with the society through kinship ties and culture. The courtyard is hence not only utilized by single family but by a whole Rana Tharu community.

The Verandah: It is used for outdoor sleeping and a family lounge for Rana Tharu. The woman stitching their decorative cloths and nursing their babies at this place. The *Khatia* (bed frames), fishing tools, cycle, and small *Kuthia* are also kept in this area. This space acts as semi-private space and is most suitable for hot climate. The width varies from 2m to 6 m and length similar to the house.

Rooms and Mezzanine: The rooms are used for storage and sleeping purpose only. Mezzanine is used for storage of grains and other household goods. Rooms and mezzanine serve as private space for Rana Tharus. The rooms are of 4mX2mX6m (hall) size. In a traditional Rana Tharu house, the kitchen does not have outlet for smoke to escape. There is a lack of proper toilet system. However, they have now started to construct toilets nearby the houses. Window size in traditional buildings is relatively very small room use is changed such as for reading and others. Regular repairs and maintenance of the houses after every rainy season is done.

3.5 Climatic Response of the House

The climate of the Terai region of Far Western Nepal is hot and humid. The maximum temperature reaches up to 44 degree Celsius and minimum temperature up to 3 degree Celsius. Rana Tharu buildings are found climatically suitable for the hot and humid climate of Terai region.

The Main House:

Some of the key facts obtained from the climatic analysis of the Main House of Rana Tharu are summarized as: (i) the long axis of main house is north-south and hence less penetration of solar radiation is obtained during summer; (ii) the long verandah is shaded during daytime and useful for various purposes. It also acts as a barrier for the transmission of heat to the rooms; (iii) the courtyard is used mostly at morning and evening time during summer period while in winter time, it is more useful for daytime; (iv) the 150 mm thick mud plastered wall of Rana Tharu house protect direct transmission of heat from outside; (v) the roof projection on the south side of the main building acts as a barrier for the transmission of the heat during summer; (vi) the mezzanine floor also reduces the transmission of heat.

The Bangla House:

Some of the key facts obtained from the climatic analysis of the Bangla House of Rana Tharu are summarized as: (i) the main axis of Bangla house lie along the east west and facing towards the courtyard in the south. It poses a wide verandah up to 6m width. The depth of the verandah does not penetrate solar radiation to the inner space and provides living space during summer time; (ii) Rana Tharu traditionally use mud plaster with smooth finishing and sometimes white wash. The mud plastered wall on both sides protects the solar heat to transmit inside the building. These houses, in fact, are suitable for serving Rana Tharu family activities and life style. These are the product of proper use of knowledge of local materials, their need for shelter, climatic condition and social and economic consideration.

Climatically, the Rana Tharu houses are most suitable for Far western Terai region. The average width of the house varies up to 30 feet and length up to 40 feet. The height of the house is up to 20 feet and the slope angle of roof lies in between 18 and 25 degree. The spaces, construction techniques, materials used and design of house provide comfort to Rana Tharus in hot and humid climate and also support them continuing their cultural and social activities.

Figure 10: Transverse Section of Bangla House

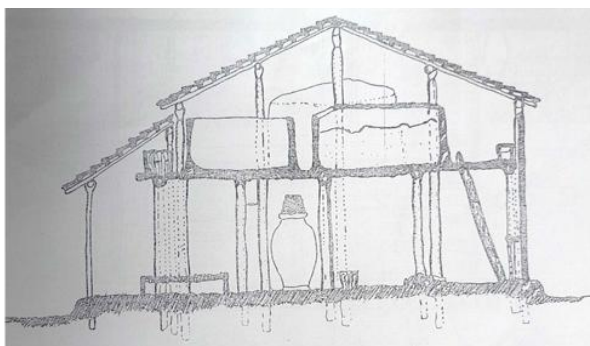
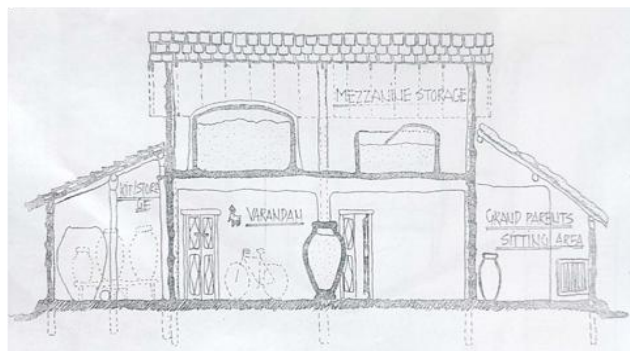


Figure 11: Longitudinal Section of Bangla House



3.6 Changes in Architectural Style and Construction Practices

The changes in the society are inevitable and these changes are driven by different factors of the society. In this research, the changes in the settlement of Rana Tharus are analyzed to understand the reason behind changes and the importance of the changes in the settlement. Vernacular architecture and building construction methods have been changed greatly in the last decades. The construction practice of Rana Tharus has also been changed from grass-mud to the concrete-steel. Rana Tharus have now begun to replace their thatched roofs with *Khaprahels* (baked-earthen tiles) and recently with GI sheets and RCC roofing. Due to their contact with people of better standards of living, Rana Tharus are developing taste for artistic carving such as decoration on the doors and pillars of houses. The main reasons for replacing thatch by *Khaprahels* and making more decorative houses are as (i) Rana Tharus have learnt to fight the damage caused by frequent fires to their thatched houses by having *Khaprehls* for roofing; (ii) rise in the income level of the Rana Tharu cultivators, who are gaining a better knowledge of marketing for selling their product at a higher rate, is enabling them to meet the cost of building better house. Now they are building their houses with bricks and RCC technology; most of them have almost lost their pattern of traditional architecture, settlement structure and culture. One of the key informants from Rana Tharu community commented that:

“We have not followed our traditional architecture in the construction of our new house nor do we use the traditional construction materials and technology. We can see RCC structure with flat roof, plastered and colored brick wall and large wooden and aluminium doors and windows. Previously, we preferred wood as a key structural member, Senth (bamboo like grass) as a wallelement, Dehry as internal partition wall, Khaprehls as roofing materials and mud and wheat chaff as plaster. Nowadays, these materials are neither easily available in the villages nor preferred by the Rana Tharus. In addition, there is a limited plot size and we cannot make our large traditional plans in our small piece of land. The land size is squeezed with the division of property among family members”.

It is evident that there has been a transformation in the construction of residential buildings of Rana Tharus specifically from a thatched slope roof house to *Khaprehls*, GI sheets and RCC flat roofs. Transformation is observed not only in the architecture but also in their dialect, dress, ornaments and culture of Rana Tharus. With the continuous migration of people from Hilly area to Terai region, the indigenous Rana Tharus interact with different cultures leading to change in cultural pattern and undergone in the process of cultural assimilation in the community. The effects of assimilation are observed in every settlement of Rana Tharus. It is observed that increase in income has pushed Rana Tharus adopting modern goods and materials. One of the local residents and tourism entrepreneur from Rana Tharu village at Naya Basti expressed that:

“Nowadays, at least a member of each house is working in Korea, Middle East and other foreign countries as well as started working in different service sectors including government offices and private companies. In the villages, we have been also engaged in multiple jobs such as Rana Tharus have started Home Stay Tourism Programmes and Cooperatives in the community. Some have also owned their vehicles to carry tourists in Shuklaphanta National Park. Currently, eight families of Rana Tharu have started home stay services for tourists in Naya Basti Village. They are completely dependent on tourism and agriculture and some amount of income from lodging facilities (10%) will go to the common fund for community development activities in the village. In addition, we have started commercial vegetable farming

instead of traditional Rice and Wheat farming. Many Rana Tharus have also sold their agricultural land to construct modern buildings and invest on education for their children. Indeed, we believe that we have to earn through different means to survive better life in a village. With this increased income, Rana Tharus have adopted modern construction technology and materials to build their houses. We have also borrowed some cultural elements from Pahadi community in addition to using electronic gadgets. Most of Rana Tharus started celebrating Dashain and use Tika in the religious and cultural ceremonies”.

From the survey findings, it can be summarized that the key factors causing changes in the traditional architecture and settlements of Rana Tharus include: (i) increase in income level of Rana Tharus that encouraged them adopting new design, new materials and construction techniques for their houses; (ii) lack of availability of traditional construction materials in the villages; (iii) decreasing plot size due to division of land property among family members; (iv) need of regular maintenance and repair of the mud houses after every rainy season also pushed them towards modern construction systems (v) the influence of globalization and technological development; (vi) attraction towards culture of relatively affluent pahadi community; (vii) infrastructural development in the villages such as roads, electricity, telephones, television, community buildings, drinking water facilities, and home stay tourism development in the villages. More specifically, the construction of black topped road has played an important role in reshaping of the settlement; development of the road leads to the possibilities that villagers never experience before. In this regard, it is very crucial to understand the local culture and architecture and make local people aware of and motivate to use their architecture so that their values, heritage and identity will be preserved for future generations.

4.0 Conclusion

The Rana Tharu society and their culture, religion, identity and very existence are intimately linked to the art and architecture they hold. Unfortunately, Rana Tharus of Far Western Nepal are losing their indigenous art and architecture. Their cultural and architectural identity has been threatened in many ways. There has been a transformation in the settlement pattern, house form, construction materials and architectural detailing. They have started to build new houses, copied from hill people which are in fact not climatically suitable in hot and humid climate of Far Western Terai. It seems that they are neglecting their indigenous building materials, construction technology, housing pattern, clothing and food culture gradually. As most of the material used in the vernacular architecture is locally available; the transportation cost and energy are saved. The material is from nature and it goes to nature after the end of its life, there is no energy used or any unnecessary pollutants created harming nature. The design principles of vernacular architecture clearly reflect the key elements of sustainability. Considering the significance of vernacular architecture in achieving sustainability, it is crucial to focus on the use of indigenous material and architecture in the new construction. Local people need to be aware of their cultural and architectural identity and the concerned stakeholders including local government should focus on the study of vernacular architecture, its importance and suitability in the hot and humid climate and encourage Rana Tharu to improve and use indigenous technology and materials so as to preserve and promote their local identity of vernacular architecture, art and culture.

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