

TRADITIONAL FARMHOUSE AND CONTEMPORARY DWELLINGS OF BHUTAN- A TRANSFORMATION

Wangzom Dorji

Department of Human Settlement, MoWHS
wangzom5[at]gmail.com

Abstract.

Vernacular architecture is the physical manifestation of culture of a people and it comprises of dwellings and buildings of people. The dwellings are built in harmony with local environment using local materials and technologies. The vernacular or traditional farm houses in Bhutan has evolved over the centuries using age old skills and methods of construction. On the contrary, contemporary dwellings in Bhutan has come up over last decades due to urbanization leading to better social and economic lives. This paper seeks to present, compare vernacular and contemporary housing and discuss the transformation of vernacular houses into contemporary buildings. Transformation has brought in certain positive changes, however, the preservation of unique identity through the superficial incorporation of architectural features needs to be pondered upon, as there is threat of gradual loss of indigenous skills and methods of construction.

Keywords: vernacular ,traditional farm houses, contemporary buildings, transformation, architecture

1. INTRODUCTION

Bhutan is a small landlocked country between India and China with an area of 38,394 sq. km [13]. The population of the country is 735553 in 2017 and out of the total 62.2 % lived in villages and 37.8% lived in urban centres [10]. About 57% of the total population depend on agriculture, livestock and forests for their livelihoods [15]. Bhutan has been isolated for centuries and it is only in 1960's that the country opened to the world outside. Centuries of isolation has led to preservation of its architectural heritage. The main roots of its architecture go back to Tibet. The different examples of traditional Bhutanese architectures are *Dzongs* (large fortresses), *Lhakhang* (temples), *Choeten* (Stupa), *Phodrang* (Palaces), iron bridges and vernacular dwellings/traditional farm houses [5],[8]. The main traditional features of Bhutanese Architecture are trefoil arch, sloping roof and cornices. As Bhutan has 72.5 % forest cover [13], and it means plenty of wood leading to excessive use of wood in the constructions. Bhutan has alpine type vegetation such as oak, rhododendron, cypress, juniper, pine and fir. Cypress and pine wood is largely used for the construction.



Figure 1. Map of Bhutan from Wikipedia (L) , Choeten (Top Right),Dzong (Bottom Right), *Source:* The Author.

The different architectural heritage structures have stood the test of time and lasted for centuries. For instance, the first fortress in Bhutan, Simtokha Dzong was built in the 16th century and it stands high till today. The heritages such as *Lhakhangs*, *Dzongs* and *Choetens* are not frequently built like the traditional farmhouses. The farms houses have evolved over the centuries, whereas contemporary dwellings have come up over the last few decades due to availability of new building materials. In the traditional farmhouses, wood, mud and stones are the construction materials but in the contemporary houses, concrete, brick, glass, steel, aluminium, corrugated galvanised iron sheet are used. With new materials, new typologies of buildings have evolved. The contemporary buildings are apartment or single detached houses. The traditional farmhouses were basically 2-3 storeys and a family used to live in the whole house.



Figure 2. Traditional Farm house with sloping roof, trefoil arch window and cornices ,*Source:* The Author.

2. METHODOLOGY

For comparative studies, detailed background studies of traditional farm houses comprising of spatial layout, construction techniques for foundation and walls is carried out along with for contemporary buildings. The comparison is made in terms of spatial layout and the evolution of traditional architectural features. The collection of data is through secondary methods (publications and other relevant documents).

3. TRADITIONAL FARM HOUSE

Background

Vernacular architecture is the physical manifestation of culture of a people and it comprises of dwellings and buildings of people [16]. The dwellings/buildings are built in harmony with local environment using local materials and technologies. Depending on the location in the country, the traditional farmhouses are built in clusters or scattered, and surrounded by paddy fields. The arrangement of houses is done in such a way that it mitigates the climatic influences. Major part of the country has strong and cold winds blowing most of the year [12]. The houses in the colder regions are built in compact cluster and the space between the roof and living spaces are drastically reduced to keep the building warm [4]. Overlooking the valley is the Dzong that serves as administrative headquarters and as monastery [1].

Central parts of Bhutan had scattered kind of settlement wherein houses are in groups of 4-5 and sometimes only one house in a plot. In areas of limited agricultural land, the traditional farmhouses are dispersed resulting into secluded farmsteads. The architectural features vary minimally depending on the climate and environmental conditions of the area. Walls are constructed of stone masonry with minimal decoration in central and eastern regions, whereas rammed mud wall are used in western regions of Bhutan. Owing to the availability of new construction materials like concrete, steel and glass, the traditional houses are replaced by contemporary buildings and there are very few traditional structures in major urban centres across the country.

A Bhutanese home encompasses other aspects such as social, economic and religious besides providing space for residence. The houses are usually 2-3 storeys high with an attic. A semi-public courtyard in front of the house enclosed by walls, acts as a transition space between the private space (farmhouse) and the outside open space. The courtyard is used to keep animals and store agricultural tools, since majority are farmers and the men work in the fields and woman at home does cooking and weaving [1]. The tradition of constructing farm houses have developed since ages and it relies on community help and use of the locally available materials [2]. The masons and carpenters have learned *through direct handing down of knowledge rather than from foreign interpretations* [6].

The traditional farmhouses are decorated with different motifs like flowers, religious or animals. The commonly found designs are of lotus, the eight auspicious symbols, mythical animals etc. The roof of the house has a prayer flag fluttering and it is believed that the prayers of the family are sent to the wind with each flutter [1].

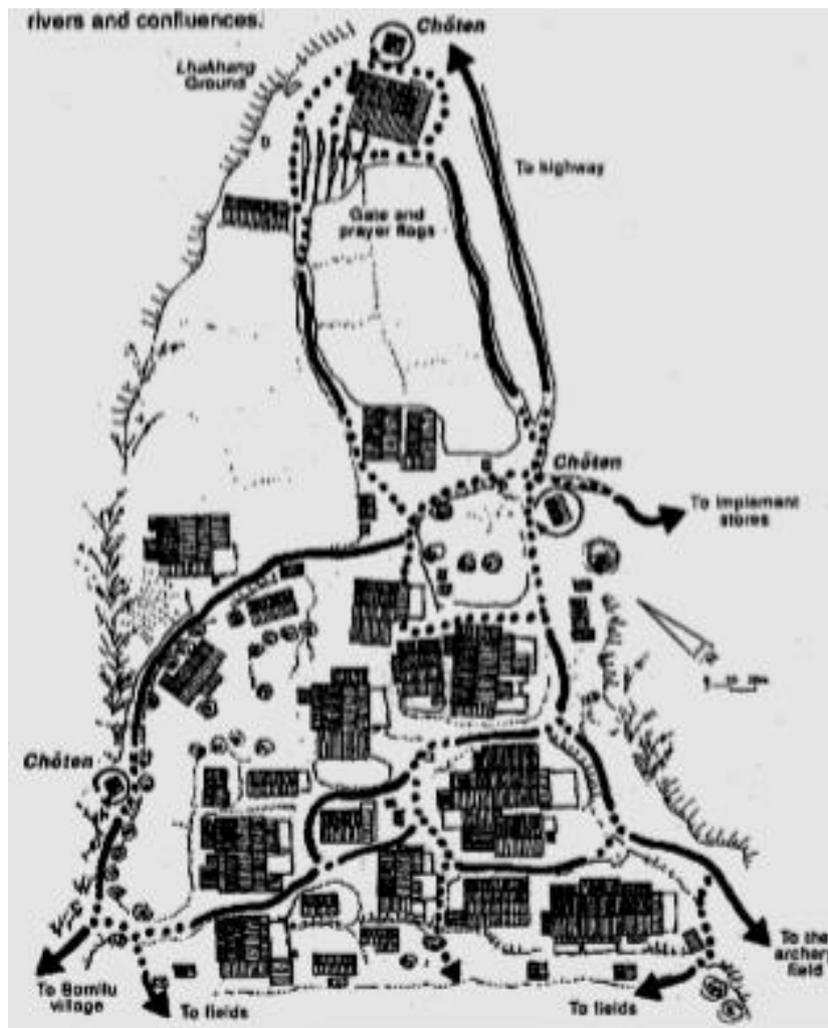


Figure 3. Layout plan of Rukubji, a village settlement in Central Bhutan in 1994, Source: [2].

Floor Plan

The layout plan is rectangular in shape. The houses have different floors with ground floor used as animal shelter and other floors for residence and religious purposes. It has semi-public spaces such as prayer room or altar, guest room, weaving and storerooms, public space as kitchen and private space as bedrooms. The kitchens did not have chimney due to which the smoke vent through windows and left layer of soot over everything, which protected the wood from insects [3].

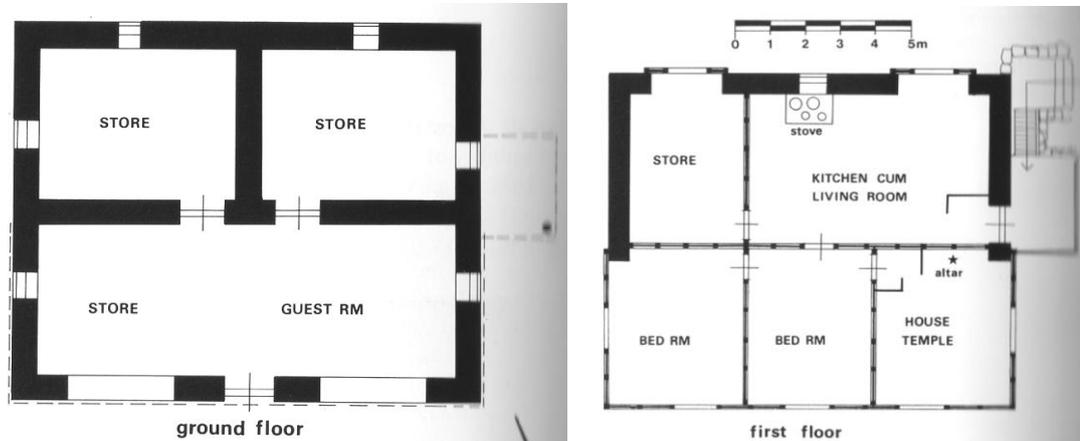


Figure 4. Plans of Traditional Farm House (Ground and First Floors) ,*Source:* [11].

The walls are constructed out of rammed earth wall mostly painted in white or in stone masonry. The ground floor has thick earth walls with very minimal and small openings and a door. The upper floors are enclosed with mud walls and timber frame structure with in-fill of plastered bamboo weaving (*ekra*). The timber frame structure has continuous several windows and the floor at this level has good light and ventilation. It is projected from the lower ground level wall and called as *Rabsel*. This floor is where living spaces are located and family lives. It is noticeable that traditionally, the windows on upper floor are bigger than those on the floors below.

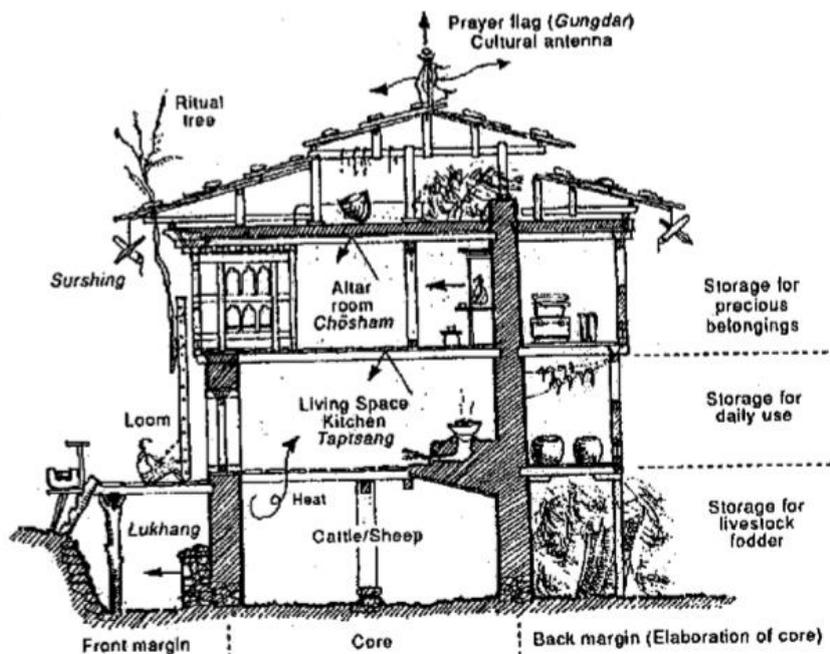
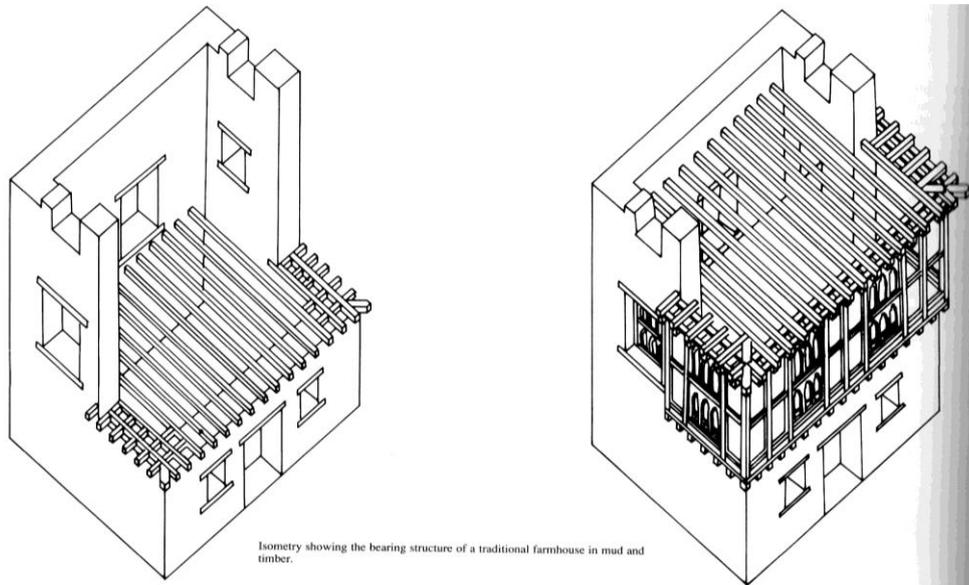


Figure 5. Sketch showing organization of spaces within and at front/back of the



Traditional FarmHouse, *Source*: [2].

Figure 6. Construction of Traditional House, *Source*: [11].

To go to the first floor, one must climb a narrow ladder made from tree trunk. The top floor has guest room and bedroom for the family. There is also a weaving room on this floor. The other important room of the house is *Choesham* (prayer room). It is the private Buddhist altar, elaborately decorated similar to interior of the temples.

The attic is an open space through which wind blows freely. It serves the purpose of storage and drying of vegetables and winter feed for cattle. The houses have pitched timber roof shingle. The roof is pitched for quick water discharge during excessive rainfall during summer monsoon. It is made of wooden shingles over which laths run across. The roof is held in place by the stones placed over the lath and shingles [11]. The slope of the roof is normally 15 degrees or less. The toilet is constructed separately from the house and sometimes even the kitchen.





Figure 7. Traditional FarmHouse at back drop of paddy cultivation, *Source:* The Author

Figure 8. Traditional Farm House built of stone masonry and wood in eastern Bhutan, *Source:* The Author

Traditional Construction

Foundation

The foundation is laid with deep, rubble filled trench of 80-100cm wide and about 120cm depth. The round boulders are broken down into rough edge pieces in order to get a good grip. The width of trench depends on the thickness of wall. The stone foundation is raised 40-80cm above ground to stop dampness from rising into the rammed earth walls and also to protect from splashing rain water [11].

Wall

Following the stone foundation, 2.5 m long shuttering are placed on both sides attached to cross beams and held in place with wedges. The space width between the shutters determines the width of the mud wall. The moist mud is put in the space between the shutters and rammed till the maximum height of the shutter (60 cm) is achieved. The ramming of the moist mud is carried out by woman using a wooden rammer tool. The method is continued till the desired height of the wall is achieved. This procedure leaves behind marks of different layers of walls. Once the earth wall has dried up, cross beams and shutters are taken out of the wall. This leaves square openings, which are left open or are filled. The dried walls are left as it is without plaster or it is plastered and whitewashed. The walls are *built in L-Shaped elevation* and serves as the structural support of house [14]. The sheer weight of 80-100cm thick wall gives the building its stability even during earthquakes and tremors. The rammed earth wall has properties that

maintains warm temperature inside during winter months and cool temperature during summer. A two storied house is most common, although one and three storied varieties also occur frequently.

4. CONTEMPORARY BUILDINGS

Background

Development in contemporary Bhutan is guided by nine principles *conceived through the vision and foresight of His Majesty the King* and one of them is 'Preservation of Traditional Art and Culture' [9]. The centuries of isolation and the process of development that has occurred late has offered us the opportunity to learn from the experiences of other countries [9]. It was realised that it is important to preserve our unique traditions and culture to maintain our sovereignty and unique identity. But these unique traditions and culture are waning due to advent of contemporary methods and technologies. These effects are seen in our houses owing to which it was essential to preserve and enhance traditional building constructions methods. It was made mandatory to incorporate traditional architectural features in contemporary buildings, due to which a new contemporary buildings with traditional touch has evolved over the decades.

The contemporary houses evolved after the advent of new building materials such as concrete, steel, bricks, glass and corrugated iron sheet. The contemporary buildings are built by imported labours from neighbouring countries. The houses are either apartment type or single detached house. The apartment houses are 3 to 6 stories and some with attic. The attics in traditional farm house were open space without wall enclosure, whereas in contemporary house it has been converted to habitable space to economise on land. The contemporary houses are found mostly in urban centres.

Construction

It is usually a frame structure, where there are beams and columns to bear the load of building and walls acting only as a partition unlike in the traditional farm house. The construction technology is still at nascent stage and it is mostly done manually. The traditional architectural features such as cornices are prefabricated out of wood or moulded from concrete with steel reinforcement. The windows are prefabricated units of timber, which are fixed during construction. The roofs are corrugated galvanised iron sheet supported on steel or timber trusses and fixed with nuts and bolts.

Comparison

In the process of transformation, the elements of traditional architecture have lost its structural function in contemporary buildings. The layer of cornices at each level in traditional farm houses acted as beams to support the floor above it and transfer the load to the mud walls. In contemporary buildings, the cornices are just used as a decorative element.

The temperatures in traditional houses are well regulated as per the seasons. It is warm inside during winters and cool during the summers unlike contemporary buildings, where additional cooling or heating systems or devices are required.

Transformation

In the course of transformation, there have been buildings, where the traditional features could not be incorporated properly with regard to proportion and balance as in traditional houses. This resulted into aesthetically unpleasing buildings. The farm houses have an excellent harmony and proportion as if it were designed before construction. It is said that in reality the traditional houses were built without any drawings and the local carpenters and masons administer the construction [8]. In the recent years, contemporary architects have prepared a 'Bhutanese Architecture Guidelines' to guide designers in design of traditional or contemporary buildings.

On the other hand, many of the contemporary buildings have been built incorporating traditional features very well. The further transformation of the contemporary buildings is characterised by huge glass fenestration blended well with traditional features and spatial changes.



Figure 9. Contemporary Apartment Houses, *Source:* The Author



Figure 10: Contemporary Commercial Building opposite to Traditional House,
Source: The Author



Figure 11 : **Contemporary Institutional Building adjacent to Traditional House**, *Source: The Author*

The transformation of traditional attic, which was open space for drying vegetables or fodder, has been transformed into habitable units in some of the contemporary buildings. In past few years, the building owners have developed attic into habitable rooms illegally, to economise on land prices and housing loans. The building of attic has been legalised at one point of time to encourage better and liveable attic spaces.

The traditional windows with small openings have evolved into huge window openings with traditional features intact. In contemporary commercial buildings or stairway windows of residential buildings, huge running fenestration is seen to provide enough light. The spatial layouts have improved for the better with kitchen and toilet within the house unlike in traditional houses.

5. CONCLUSION

The transformation has been triggered with advent of new building materials. The other factors include change of lifestyle, economic capacity and socio-economic factors due to development and urbanization. Though the traditional buildings are sustainable as it is built with locally available materials and is much cheaper, the contemporary buildings have taken over it. In urban centres, few traditional houses could be seen these days. There is threat of the gradual lose of the indigenous skills and methods.

The traditional architecture structures of Bhutan have stood over the centuries and it has been functionally efficient and aesthetically very pleasing. It is an identity for the Bhutanese people and the need was felt to preserve it. Subsequently, it was made mandatory to incorporate traditional architectural features in contemporary buildings.

The contemporary designers have the challenge to balance between traditional and contemporary features in a contemporary building. Over the years, the result has evolved for the better with experiences and challenges. The contemporary construction materials and skills have made the provision of new spaces, creation of forms and method of buildings easier and flexible [6]. However, unlike mud walls, concrete walls have not been able to provide an apt temperature due to which mechanical heating and cooling systems have to be incorporated.

The transformation of contemporary building over the time has been towards a positive side and it is expected to move further with the traditional features still incorporated. It will be a great challenge for designers as there are some inherent restrictions due to traditional architectural features incorporation.

The evolution has been able to intensify development as Bhutan has very less developable land. The traditional 2-3 storey is replaced by 4-5 storeys and even more (in case of commercial and office buildings). In one way, the development of the contemporary buildings has been a consequence of population growth and rising land prices.

The evolution will proceed as per changing needs of the people and other factors in due course of time. However, as a Bhutanese it is crucial to ponder if the superficial incorporation of traditional architectural features helps to preserve the vernacular construction skills and methods, and if the contemporary buildings represent the unique identity of Bhutan.

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