

## **Understanding change in Himalayan vernacular houses**

An appraisal of Uttarkashi in view of global connectivity and natural disasters

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### ***About the author***

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### **Introduction**

The Himalayan chains of mountains form the northern boundary of India. Many settlements in the region have maintained unbroken traditions in their cultural practices and their built form. But as the otherwise remote settlements become more connected with other parts of the country and the world, vernacular architecture traditions of the area are undergoing change. Change in vernacular architecture of the Himalayas needs to be deconstructed and understood in a comprehensive manner, to be able to evolve a holistic view on the issue of change and continuity in this region. Case study of village Mukhba in Uttarkashi district of Uttaranchal state has been taken up to understand the issues of change in vernacular building traditions in the area

### **The case study**

Mukhba village is a typical example of a high altitude settlement of the Indian Himalayas. The altitude and the bitter cold climate make such settlements somewhat inaccessible, in comparison with settlement in the foothills or plains, and they are characterized by low density of population and hardly any industrialization<sup>1</sup>. It is 1.2 km from the national highway road from Uttarkashi town (at a distance of 70 km) to the important Hindu pilgrim center of Gangotri. Mukhba has a small population with majority being upper caste Hindu Brahmins<sup>2</sup>. The male member of many families, traditionally serve as priests at the Gangotri temple nearby<sup>3</sup>.



Fig. 1. View of Mukhba



Fig. 2. Settlement Pattern

The houses are built along the slope facing the east-south-east direction as shown in figure 2. The east facing dwelling is attributed to the direction of the main Gangotri temple, an important religious reference for the community (Mawani 39)

### **Global flows, natural disasters and local identities**

India has moved from a planned and protected system to a more open market economy. Globalization is an attempt by India to join other industrialized nations to accrue material benefit that free markets seems to offer. “These changes represent a massive social and economic experiment with no parallels in history” (Prahlad 1). It is important for the purpose of this study, that we clearly establish the change that globalization has brought about in the economic, political and social sectors of our study area. Does economic globalization lead to a cultural globalization or a reinforcement of the local identity and in either case how does it affect the built form? “It would be regrettable if ultimately a bland world culture replaced the vibrant variety of local culture”(Logan XV). It would be interesting to observe whether the new communication techniques associated with globalization<sup>4</sup>, bring about a completely new set of imagery and aspirations amongst the people? This would be more valid for our study area, wherein the district has not experienced any direct economic changes due to the opening up of the Indian markets

The October 1991 earthquake in this region brought down many structures in many parts of Uttarkashi district. It would be interesting to now observe if the communities of this region are looking to solutions provided by external sources to ensure safer buildings or are looking inwards towards their local knowledge traditions to find some answers.

The key questions that we need to know are:-

What is the nature of change in the vernacular dwellings in Mukhba and what role has global connectivity and recent natural disasters played in it?

Does the physical change in the houses question the very fundamental principles that structure them or do they operate within these principles?

### **The dwellings of Mukhba - General description**

The houses in this part of the Himalayas are commonly occupied by more than one family that are related to each other. The primary building material is stone and wood. The houses are usually linear in shape with a verandah on the longer side with two or three rooms opening to the verandah. The ends of the verandah are usually closed and form an enclosed space used as temple, storage or toilet. The ground floor is used for domestic animals; the first floor has living rooms and the second floor kitchens. A family owns vertical slice of the building consisting of a kitchen, living, and room for livestock. Apart from this the food grain storage are stand alone structures which are present in the open front yard

### **Key physical attributes of the dwellings -**

#### **Linear organization**

The main building is organized in a linear fashion so as to expose the long verandah towards sunlight ensuring maximum heat gain to the semi covered verandah. The verandah is the main daytime activity area and the shared space for all the family staying together in the same building. See figure 3 and 4.

#### **Hierarchy of spaces and the idea of a 'Room' as a refuge**

The verandah is the main living space and rooms are used as special area for sleeping, storage, cooking and resting. The rooms with minimum opening and thick walls provide refuge from the cold conditions outside while conserving inner heat.

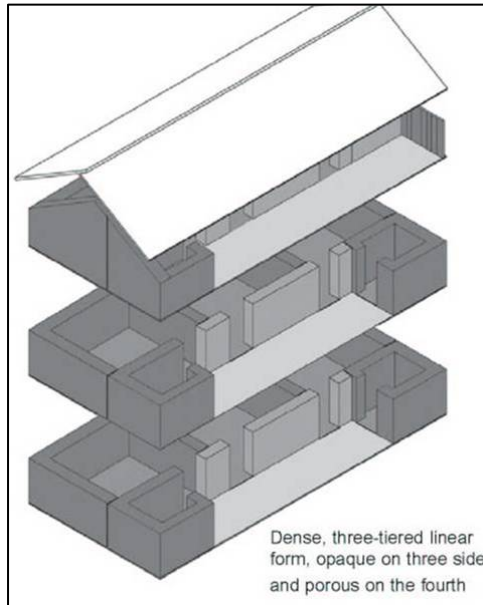


Fig. 3. Linear organization

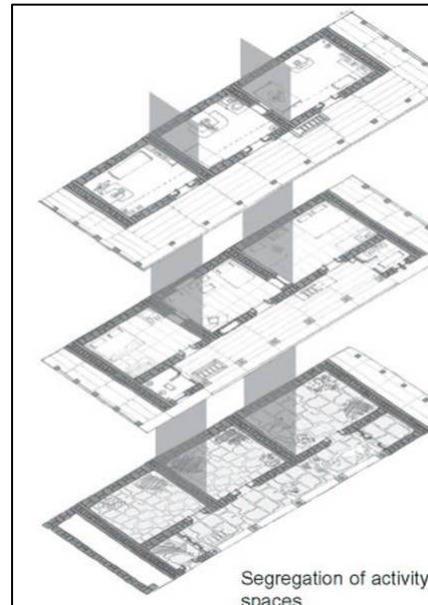


Fig. 4. Vertical Ownership

### **The 'house-complex'**

The house is not complete without its front yard and two or three grain storage structures. The manner in which the grain and firewood storage are placed around the front yard demarcates the territory of the families. The yard is slightly raised, leveled and often paved with stone giving prominence to the area.

### **Structural System and its seismic resistance**

The structural system of the walls consists of alternating horizontal bands of wooden beams and stone masonry that support a sloping wooden roof. The intermediate floors are made of wooden rafters with board, and the floor of the verandah is supported by wooden columns. All the building material is available locally. The use of wood in walls provides stability from horizontal thrust during earthquake. Shorter upper floors and extensive use of wood results in a lighter construction, ensuring better seismic response of the building during earthquake.

Having established the key attributes of the dwelling at Mukhba, it is important that we understand its main structuring principles. Structuring principles here refers to the most fundamental set of relationships between cultural parameters (social institutions, economy), physical parameters (climate, material, technology) and the built form.

## Social Institutions – The family and the community

The social arrangement within a family and the sense of community are important factors that justify the linear organization of spaces with large semi-covered verandah. The same building could have 2 to 3 families' living together, having separate kitchen and living area. This family structure is neither that of joint family nor nuclear, however certain spaces like verandah, open yard and grain store are shared. This arrangement of families living together with each having an ownership of a vertical slice of enclosed space along with certain shared spaces is reflected in a plan which is linear thereby ensuring equal climatic advantages to all the families.



Fig. 5. Typical House



Fig. 6. Low height of buildings



Fig. 7. Use of alternate bands of wood

## Material culture - Economy and technology

The agrarian base of the village becomes the fundamental reason for the organization of the various parts of the house around an open yard. Granaries, firewood storage, livestock are all organized on the ground floor around the open yard and the living areas are all upper floors. The mode of economy of the area directly influences the house type. The ability to harness the available local material mainly wood and stone and use them to counter the tough natural condition of cold weather and frequent earthquake is a special and valuable feature of the dwellings at Mukhba.



Fig. 8. Verandah in an old house



Fig. 9. Verandah in a recent construction

## Understanding change

The Uttarkashi area experienced an earthquake measuring 6.6 on the Richter scale on October 20, 1991. This is the same year when the Indian market began to open up and get connected with the global currents. The faith towards local building traditions have increased looking at its excellent seismic response observed during the earthquake.

## Global flows and remote settlements

The Indian market is now more open than any other times. The reforms have been directed towards opening of the Indian market for goods and services to the world along with encouraging Indian brands to compete globally. There is a change in the lifestyle and consumption pattern of the select few, who are able to accrue benefits form this change. Sassen

has argued that cities are playing a strategic new role as command points of the economy, location for specialized services, sites of innovation and as markets for the products (3).

The key question would be to know how the winds of change that are engulfing the select islands of the privileged few affect the culture and consequently the built environment of the Himalayan region of India. One possible direct impact of globalization is the increase in number of tourist visiting the Uttaranchal state<sup>5</sup>.

The other impact of globalization has been associated with the free flow of information accessible to all through television, internet and telephony. Many families in Mukhba own satellite television for the past 6-7 years and are well connected through telephone. These new means of communication has definitely brought settlements like Mukhba closer to other parts of the country especially in terms of flow of critical information available to the administration in particular and the people in general regarding landslides, floods, snowfall or roadblocks. It also means that people of the village becomes recipient of images and information associated with the popular culture of other parts of the country and the world. Whereas the majority of the flow of information that is created in select centers of the country is not targeted at settlements like Mukhba but the residents there do become passive participants in the process. But what is most interesting is the fact that the same technology and medium that becomes the vehicle for exchange of information and spread of universal style statement throughout the cities in India become the means to reinforce the regional, cultural and ethnic identity in the study area. Satellite television, local short message servicing on mobile phones and compact discs are used by local cultural groups, community associations and traders to network in a limited space resulting in strengthening and reinforcing of ethnic, religious or regional identities. The foundations of this community rest on very strong social institutions and changes in the same are more peripheral and superficial. Certain social indicators like the institution of marriage, celebration of festivals or mourning of the dead, have not fundamentally changed in spirit but have only experienced certain superficial alterations. It would be now interesting to observe how the community perceive and respond to these changes in the built environment.

### **Change in spatial organization**

*Linear organization, spatial relationship between parts, importance to semi-covered, concept of rooms and the house as a complex.*

As mentioned earlier the basic organization of the house is largely determined by the nature of the family organization, agriculture based economy and climatic considerations. Figure 10 and 11 shows house which is around 200 year old with an extension made six years back. For the purpose of discussion the dwelling is referred as house-1 in the paper. The extended part of the house is added perpendicular to the main old house and its semi-covered area faces the north direction, not the best direction for the living area to face in this climate. The importance that is usually accorded to the semi-covered verandah is missing by the way of its reduced proportions as compared to the living area. The width of the verandah makes it useful only as a corridor to access the rooms and does not allow for daytime activities. The number and size of openings of the room to the verandah is much more than in the traditional type making the climatic response of the building extremely poor. Moreover the building height of the first floor is more than the older part. See fig 11.

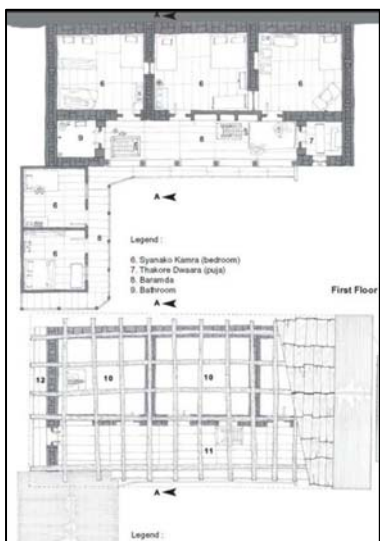


Fig. 10. House 1, Plan

Fig. 11. House 1, View

Another dwelling (house-2), is shown in figure 12. This house was constructed six years back and in a more dense part of the village closer to the main temple of the village. Having being built only six years ago, it is a good example to look for changes in the organizational principle. The house is based on the same linear type, of series of enclosed rooms with verandah on the longer side. The overall proportion of the semi-covered to the covered is generous enough as per the continuing tradition and still suggests an important position for the verandah. But the



presence of large windows in the room opening on to the verandah is definite departure from the past (see fig 12). Seen in tandem with the manner in which furniture is used in the living rooms it becomes clearer that there is a definite shift in the way the residents of this house perceive and use their rooms. Figure 14 shows the interiors of the living rooms in house - 2. The treatment of surfaces, the use of furniture, and the use of showcases to display wares is a definite departure from the simpler mud plastered walls finish, minimal furniture and less openings in the traditional type. The floor height in the top floor of the house is much more than the traditional type. A low height top floor has been a distinct feature of Himalayan houses, as the intention has always been to avoid top heavy structure keeping in mind the risk of earthquake in this region. Fig 8 shows the view of verandah in one such house in Mukhba, which are generally used by women for cooking.

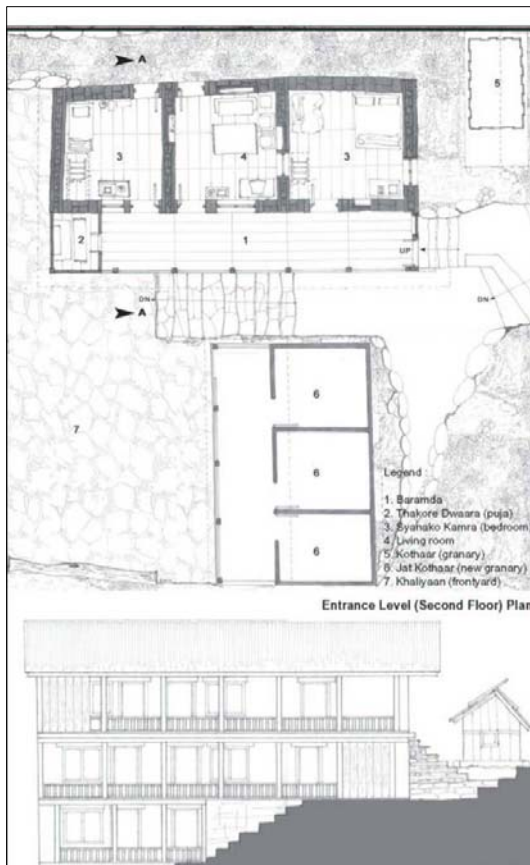


Fig. 12. House 2, Plan



Fig. 13. House 2, View



Fig. 14. House 2, View of living room

## **Change in construction system and material**

*Replacement of material, change in proportion and change in the fundamental structural system*

Easy availability of alternative building, does sometimes lead to its replacement. The change of material does not imply the change of system of construction itself. For example galvanized iron sheets have replaced wooden boards roofing in many houses of Mukhba, but have not led to any change in the wooden roof system on the top floor. But the number of wooden members are reduced which leads to saving of wood. Wood is the building block of vernacular house of this region, but over years its availability to the people has reduced. The state justifies limited access to the forest wood to control loss of forest cover, illegal logging and other environmental considerations. The appropriateness of wood when used in buildings providing excellent resistance to earthquake, thermal insulation and ease of construction has been clearly established. Its scarcity has led to a shift towards materials like reinforced cement concrete (RCC) in certain parts of the region but not many examples of the RCC were found in Mukhba

The October, 1991 Uttarkashi earthquake was a big eye opener, as majority of the structures that collapsed were poorly constructed RCC roof structures (Kulkarni 24-31). Traditional structures using horizontal wooden braces have always performed well during earthquakes. The traditional system of construction of stone and wood in walls is still used in recent construction in the village. The preference for a well established construction system still remains, however due to scarcity of wood the column dimensions and beam depth have reduced.

## **Conclusions**

### **Global information flow and the social institutions**

Looking closely at their response to these two extreme forces, it is quite clear that the family and the community traditions are given utmost importance when it comes to their dwelling architecture. The basic traditional linear organization with a semi-covered verandah in the long side of the building is preferred in new construction as well.

The effect of external imagery or information can be felt in the preference given to the enclosed room over the verandah space for certain family interactions. The room is made more airy and well lit by creating more openings, furniture element and interior finishes are added to make it more conducive for gathering of friends and family. The floor heights are also raised to make

room more spacious and allow more light especially so in top floor which were traditionally always a low volume. The family life in the interior space is becoming more important than before, a clear influence of urban lifestyle. The basic house type is being followed in new construction, but it is being modified in terms of its volume and fenestrations to support certain new lifestyle that seemed to demand use of indoor spaces.

### **Natural disaster, construction awareness and state policies**

The 1991 Uttarkashi earthquake has led to reestablishment of faith in local knowledge system in construction. The awareness about seismic resistance of local construction system is well established amongst the people of this region. The traditional crafts of building construction is still alive and practiced extensively but easy availability of alternate construction material coupled with scarcity of wood can turn things around in a few years. It is interesting to note that most of the new construction still follows the same stone and wood system but the proportionate use of wood has decreased.

### **Agrarian Economy and regional growth dynamics**

Mukhba village is a good example of an economically strong village. The agrarian base of the village has been further strengthened by a gradual shift towards cash crops and the region has not experienced any major economic upheavals in recent times. As seen earlier farm based activities have direct impact on the dwelling organization with open yard, verandahs, rooms for storage and livestock forming integral feature of the house. This continuity of farm based economic activity has also contributed to certain continuity in the built environment

The strong social institution of the community in Himalayas act as a buffer between the traditional and the new practices, resulting in gradual assimilation of information and ideas and a calibrated response in the built environment. A comprehensive view on the issue, would be the first step towards evolving consensus or policies that ensures continuity while recognizing change in architecture of the dwellings in the Himalayas

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### Notes

<sup>1</sup> The density of population for Uttarkashi district is 37 person per sq. km as compared to the state average of 159 persons. (Census)

<sup>2</sup> All the inhabitants of the village are Hindus, worshipping Goddess *Ganga*, *Lord Shiva*, *Sameshwar* and *Naag devta*

<sup>3</sup> The Semwal community of Brahmins have traditionally served as priest at the Gangotri temple. Before the national highway was made, the route to the Gangotri temple passed through the village Mukhba

<sup>4</sup> See Castell, for analysis on the role of information technology in regional and urban geography (417-24)

<sup>5</sup> In the year 2004 13.9 million tourists visited Uttaranchal state (Tourism 1).

### Credits

All the drawings and photographs in this paper have been contributed by Vrushti Mawani, compiled as part of her undergraduate research thesis report (The Built Tradition: Dwellings of Mukhba) which was guided by the author