

# Climate or socio-cultural aspects, Guiding elements in traditional house forms: A Case of Hill Houses

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**Abstract:** There are many studies conducted to emphasize the importance of climatic conditions in defining the traditional house form but in 19th century another school of thought was introduced by researchers stating that the essence of a traditional house form is the socio-cultural aspects of the community it belongs. The paper is based on understanding the role of climate and socio-cultural aspects in Indian context with reference to typical hill settlements by taking three different villages in the Kangra district, Himachal Pradesh having similar topography, climatic conditions and available resources. The study based on primary data collected using the case study method. Field visits were conducted to interview people and document traditional houses from villages selected. Typical house plan of each village is chosen for analysis and different elements of the house are related with the climate and socio-cultural aspects of the region. The points of similarity and contrast are found to understand the role of climate and socio-cultural aspects in the traditional house form. Finally, it is concluded that difference in organization of spaces, aesthetic treatment and material used accentuates the fact that socio-cultural aspects play a dominant role in deciding the form and spatial organization of spaces.

**Keywords:** Sustainability; climate; socio-cultural; traditional house forms.

## 1. Introduction

Housing sector being one of the major consumers of resources is looking for options to determine sustainable practices specially in developing countries facing critical situations due to population growth and lack of resources. Exploration of sustainable practices based on traditional know-how are popular for quite some time. Studies are done to learn from the traditional house forms in order to achieve human comfort by design of houses keeping climatic response. It is assumed that these houses are in response to the climatic conditions of the region. Exceptional cases exist where house forms are not as per the climatic conditions leading to exploration of other forces acting on the traditional house forms.

In 1970's Amos Rapoport emphasized the importance of culture in the built-up environment and explained through his works the man and nature relationship, social setup and culture taking physical manifestation through house forms. He proved this relationship to be pivotal by taking examples from every part of the world and concluded that climate and materials are just modifying factors of house form (Rapoport, 1969). Paul Oliver further took these studies and explored the relationship deeply to understand the social setup and cultural practices of a region and their translation in house forms. In his seven volume encyclopaedia he has documented traditional house forms from all parts of the world (Oliver, 1997). The United Nations Brundtland Commission in the year 1987 defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs". Three pillars of sustainability as economic, social and environmental were declared (Anon., n.d.). With UN's concern over sustainability issues, options to achieve sustainability in different fields was looked upon by nations around the world to reduce the burden on available resources. Again, on the onset 21st century, another pillar of cultural sustainability was added making overall four pillars. The UNESCO declared that no development is sustainable without including "culture" and "full integration of culture into sustainable development policies". Cultural sustainability is to be achieved by reviving our local cultures that are in sync with nature (Nurse, 2006).

The focus of the paper is on understanding the role of socio-cultural aspects in shaping the traditional house forms with climate as a modifier element. Case of three villages in the Kangra district of Himachal Pradesh has been taken to justify the same. The study is exploratory in nature with data collected in the form of unstructured interviews, documentation of traditional house forms and observations made on site. The analysis focuses on exploring main elements of a typical house from each village and finding similarities and contrast between the house and its surroundings with aspects of socio-cultural and climatic conditions. To conclude, it can be stated that by achieving cultural sustainability one can contribute in social, cultural and architectural continuity and retain local identity.

## **2. Study of traditional house forms in other parts of India**

Relevant literature study was reviewed to understand the influence of socio-cultural aspects and climate on the house form taking examples from Indian context. The traditional house form examples are analysed on the basis of their socio-cultural elements and climate. The first example is from Rajasthan having hot and arid climate. Jaisalmer Haveli's are rectangular and linear in form with rooms arranged along a central courtyard. These mansions primarily belong to merchants exhibiting grandeur through intricately carved exterior facades. The male and female domains are segregated through courtyard and for similar reason the front rooms of the house are used by outsiders and male members of family and rear portion for female members. The role of women confined to household activities, taking care of children and elderly. Multiple rooms arranged along colonnaded veranda abutting central courtyard to accommodate joint families. Lattice windows to restrict view inside the house, interaction with outside is limited to front of the house and female interaction within family takes place in courtyards and interaction with outside world is from balconies. Features supporting climatic conditions include courtyard planning as it acts as releaser of heat, the colonnaded veranda along the courtyard becomes buffer between outside and inside rooms, rooms abutting towards courtyard reducing the amount of heat entering inside the rooms. The lattice windows reduced the amount of direct sunlight entering inside. Openings provided at upper level inside the rooms as region is prone to wind storms (V.,

2005)(Gupta, 1985) (Krishnan, 1996). The second example is of Chettinad houses in Tamil Nadu experiencing tropical climate with warm, humid summers and moderate winters. The plan is rectangular with linear layout and rooms placed along central courtyard. According to the socio-cultural aspects of the community, minimum two number of courtyards provided each for male and female members. The front courtyard is used for religious activities and large enough to accommodate dining of 250 people. The rear of house meant for children, women and servants. These houses belonged to the family of lenders with business links abroad, therefore they showcase grandeur through high ceiling rooms and expensive materials like coloured marbles. Joint family structure followed resulting in addition of rooms when required. The climatic aspects incorporated are front '*Thinnai*' and colonnaded veranda around courtyard acting as buffer between outdoor and indoor space, high ceilings provided to create airy interiors and multiple openings to allow cross ventilation. The finishing materials used helped in keeping the interiors cool (V., 2005) (Patwardhan, 2018).

The third example is weaver houses of Marikal, Telangana a semi-arid area having predominantly hot and dry climate. The house forms are rectangular small units with central courtyard. These houses belonged to the weaving community. Their professional requirements are fulfilled by accommodating areas for work on three sides. The front part and upper floor is used for household and sleeping. Joint family structure adopted and all family members involved in weaving therefore no segregation of spaces within the house. Comfortable environment is provided inside keeping the size of courtyard proportional to height providing shade in the courtyard throughout, roof windows provided to avoid hot winds inside (Indraganti, 2010) (V., 2005). Another example is of Nalukettu houses of Kerela experiencing tropical humid climate. Mainly square in form, rooms arranged around central courtyard. Keeping gender roles observed by community in mind, front part of the house is meant for male and rear for female members. Cooking and storage areas also provided at the back for the convenience of female members. The kitchen led to secondary entrance at the rear leading to kitchen garden where hawkers can be entertained. Three or four generations staying together and more number of square units added to accommodate. The houses are set in groves of coconut trees to provide coconut that is ingredient of many delicacies. As area receives high rains therefore sloping roofs are provided to drain water. To keep interiors airy, window openings are to provide for cross ventilation. Level difference between courtyard and colonnaded veranda is provided to collect rain water (V., 2005)(T., 2014). Lastly, the houses of Basor community in Madhya Pradesh having tropical hot climate. Their houses are rectangular and compact with front courtyard. As the community is engaged in bamboo crafts therefore they preferred to live near forests to get raw material easily. The house has enclosed courtyard in the front used as work place, storage and selling of goods. Joint families stay together and being economic weaker section had no segregated spaces for family members. The compact house made of mud walls and thatched roof helped in keeping interiors cool. The front and rear courtyard acted as releaser of heat providing comfortable environment (Shikha Patidat, 2014).

### **3. Traditional house forms in Kangra, H. P.**

Himachal Pradesh is one of the states lying in the Himalayan ranges with altitude varying from 350-7000 meter above sea level and climate varying from hot and sub-humid tropical, warm and temperate, cool and temperate, cold high mountain and snowy frigid alpine (A.K. Jaswal, 2015). The villages chosen for study lie in the low altitude region of Kangra district having sub-humid tropical climate. The society is involved in agriculture and cultural setup is governed by religion. As per census 2011, 96.76% population

in Kangra is Hindu following the Varna system of caste hierarchy. The state has several famous Hindu pilgrimages and is known as 'Dev Bhoomi'. The study was based in Kangra district as it exhibits unique architectural style and extreme climate making thermal comfort important consideration for people. The selection of villages was based on areas having similar climatic conditions, topography and available materials so that variations can be understood in terms of architectural elements responsive to the socio-cultural considerations. The three villages chosen for study are Dhanot, Pragpur and Bharouli Kuthiyara lying in same climatic zone.

**3.1 Traditional house in village Dhanot:** The village spreads over slope of a hill overlooking the valley that is used for farming. Sloping side facing sun preferred for construction of houses in small clusters approached through meandering pathways. The houses small rectangular in plan made of mud walls, sloping roof structure of wood or bamboo covered with slates. The traditional house consisted of three main zones: the courtyard, semi-covered space and the built-up area. The built consisted of two rooms on ground floor and two rooms above, refer figure 1.

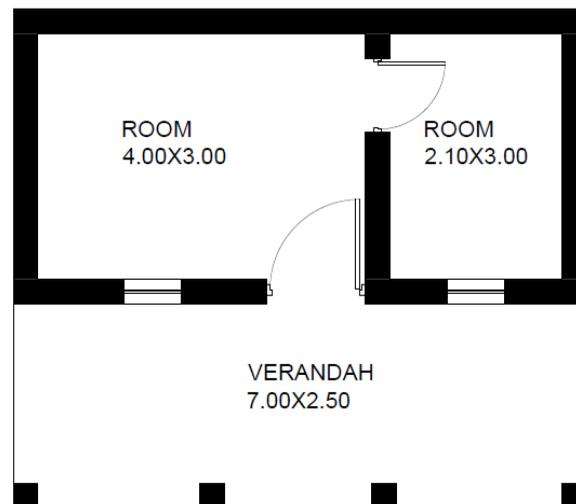


Figure 1: Typical Plan of houses in Dhanot

The main purpose of the house was for storage and cooking and for sleeping in extreme weather. The entrance room was followed by small dark room 'obri', also considered private room to be used only by family members. The upper floor 'boud' used for cooking, and storage. In some houses, space for washing of utensils provided near cooking area as 'chala'. The loft space i.e. the space between the ceiling and sloping roof of 'boud' was used to keep grains and agricultural equipment.

**Socio-cultural considerations:** The village inhabited by Rajput as dominant caste. Two- three houses of supporting communities were provided at the peripheral areas. The main profession of the people was agriculture making land a major asset. People preferred to live in small houses placed on sloping areas leaving flat land of the valleys for agriculture. The families busy throughout the day in activities related to agriculture, taking care of cattle and farm animals, processes related to making of cloth, wool and

converting them to wearable items making house place for storage, cooking and shelter from extreme weather. All members including children contributed in different capacities in household and agriculture related activities. People preferred to stay together and help each other making joint family setup. As the family busy whole day therefore need of house limited to storage and shelter from climate. Religious activities took place on occasions like marriage, child birth, death, festivals and other celebrations.

**Climatic considerations:** Houses placed facing south to receive direct sunlight throughout the day providing comfort from cold weather and light to perform daily activities. Compact house form provided thermal comfort inside the house. Thickness of walls was kept 18" to provide insulation. There was single entrance door and two small windows of small size along both sides of this door to provide insulation from cold weather. Hipped roof provided to drain off rain water as area receives heavy rains.

**3.2 Traditional house in village Pragpur:** The settlement is along a central core formed by village pond 'taal' and market along this pond. There is dense network of palatial houses near the core and the density decreases outwards. The agricultural land is on the outskirts of the village with cluster of houses near the fields. Two-to-five houses were placed along a shared central courtyard forming clusters having a walled periphery defining boundary having access through a gateway approached by narrow streets. The houses are placed adjacent to each other sharing walls with length of courtyard depending on number of houses on each side. The house found are mainly of 3 types: the first with courtyard, semi-covered space and built area; the second type did not have a semi-covered space and one can enter directly to the built-up space from the courtyard and the third type of houses had semi-covered balcony at the upper floor. This semi-covered balcony may have separate approach through stairs. There is no other difference in plans. The houses were of two or three floors, having 2-3 rooms on each floor, refer figure 2.

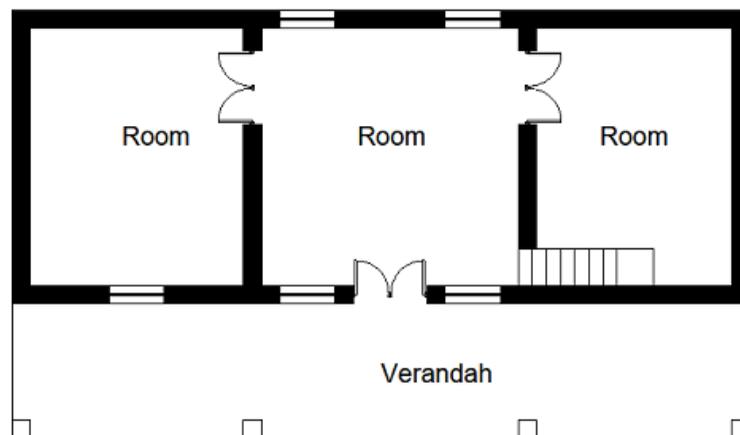


Figure 2: Typical plan of house in Pragpur

The entrance leads to the main room used mainly to receive guests, having one room one each side and a narrow staircase in the corner leading to upper floors.

**Socio-cultural considerations:** The village core was inhabited by merchant class of 'Soods' occupying the prominent location being the dominant caste in the area. The 'Soods' had their timber business in the upper Shimla area and their families stayed here. They possessed wealth and travelled for business bringing influences on architecture and technology adopted. The caste hierarchy followed outwards with lower castes occupying the outer most areas near the agricultural land. The houses sharing the common courtyard belonged to the same family. The courtyard had a 'Tulsi' plant over mud pedestal in the centre and was worshipped twice daily by women of the family. The plant was considered auspicious signifying 'devtaon ka vaas' i.e. presence of Gods and kept the evil spirits away. Men used to worship the plant during important occasions. The important family functions related to marriage, child birth, death, festivals and other ceremonies took place in the courtyard and a feast for entire community was hosted in the same. The courtyard also acted as an interaction space between the family members. The boundary wall defined the cluster and secured the clusters from outside intervention.

**Climatic considerations:** The courtyard received ample sunlight and the boundary wall restricted the cold winds to enter inside the courtyard. The compact layout of the houses provided thermal comfort inside. The kitchen placed at topmost floor keeping the floor below warm. The semi-covered space provided buffer between the outside and inside of house. The sloping roof with slate tiles drained rain water efficiently and non-porous slippery slate ensures that no water is penetrated inside. The sundried bricks covered with mud plaster provided thermal comfort. The window and door openings are provided in the front façade opening in the courtyard, small ventilator openings of different shapes are provided on other sides of the house.

**3.3 Traditional house in village Bharouli Kuthiyara:** The village was developed linearly along both sides of main road. The houses were placed on sloping areas with agricultural land surrounding them. The houses are similar to houses of Dhanot village in appearance having three main zones: the courtyard, semi-covered space and the built-up area, refer figure 3. These houses were generally single storied.

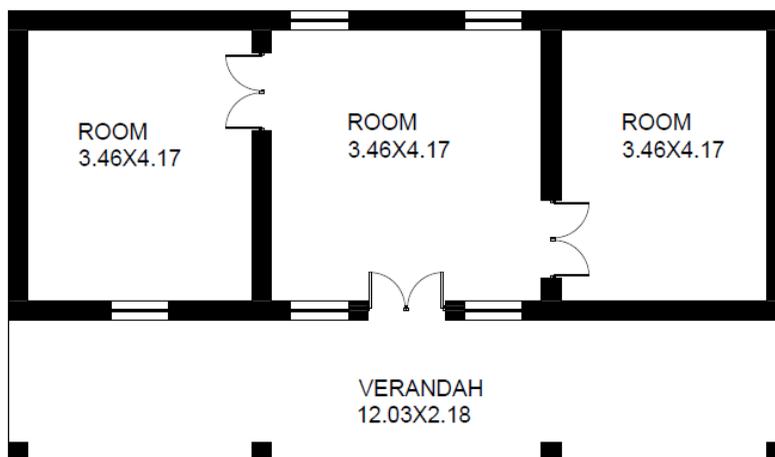


Figure 3: Typical plan of house in Bharouli Kuthiyara

**Socio-cultural considerations:** The people were involved in agriculture with moderate to poor economic status. The families of same kin had houses together in a cluster enclosing a common courtyard. The clusters belonging to Brahmin family had a 'tulsi' plant in the centre of the courtyard to be worshipped every day. The courtyard was hub of activity throughout the day and all celebrations took place there. The built-up area was used for activities to be kept isolate or involving family members. Owing to poor economic status they used simple techniques to build their houses using locally available materials.

**Climatic considerations:** The inner and outer walls were made of 18" thick mud walls to provide thermal insulation. Few necessary openings provided to keep the extreme climatic conditions at bay. Hipped roof covered with slates to facilitate the drainage of excessive rain water. The roof was projected 2'-0" to protect the walls from dampness. Plinth of stone provided to protect the penetration of rain water in the floors

#### 4. Discussion

Typical house plan is taken from each village and parameters of house form are discussed. It is observed that since the micro climate in three villages is same, the requirements of thermal comfort are same in all villages but the house forms are not same in these villages. Variations in house form are there in every village depending on the occupation, economic status, caste and family structure as shown in table 1. The houses of Dhanot and Bharouli Kuthiyara are similar in form and arrangement of spatial elements. The material and construction techniques are also similar. These similarities are because both villages have agriculture as main profession.

As the profession is same so their economic status is similar i.e. moderate to poor, making choice of materials limited to locally available materials. As they are dependent on agriculture so land is an asset and they preferred to keep all the flat land for agriculture and built houses on the slopes restricting the size of the houses. The number of rooms irrespective of members in the family is limited and surrounding landscape is similar in both villages. On the contrary, the houses in Pragpur are built on flat sites as they belonged to rich timber merchants. The houses are made of sun dried bricks with exposed surfaces or mud plastering. The door and window frames are intricately carved using best quality wood. The structures are two-three floors in height with additional attic floor. The roof profile is complex with gable windows requiring skilled workers to construct.

The houses of the farmers had simple hipped roofs constructed by family members. The houses of Bharouli Kuthiyara and Pragpur are arranged along a central courtyard with 'Tulsi' plant in the centre as daily worship of the sacred plant is essential ritual of the people living in these villages. This element is missing in Rajput community of Dhanot village. The element common in all villages is that all kin members used to build their houses in clusters enclosing a shared courtyard. The climatic aspects are taken care by providing thick walls, less openings to provide thermal insulation and sloping roofs to drain off water of excessive rains received in the region.

The material chosen is local due to accessibility issues in the past. Depending on the affordability, the houses in Pragpur used better quality wood for joinery. The aesthetic elements in the form of arched

openings, carved jambs and beautiful brick patterns on facades of houses can be seen in the houses of merchant class whereas the houses of farmers were simple and decorated by painting motifs around door frame during special occasions using rice paste.

Table 1: Comparison of elements of architecture and socio-cultural aspects

		Typical House <b>Dhanot</b>	Typical house <b>Pragpur</b>	Typical house <b>Bharouli Kuthiyara</b>
<b>Elements of House Form</b>	<b>Spatial Organization</b>	Rectangular plans, two rooms on one floor, max. two floors, 2-3 houses share common courtyard, courtyard as hub of activities, storage and cooking inside, cattle shed provided near main house	Rectangular form, three rooms on each floor, 2-5 houses share common courtyard, daily activities take place in courtyard, living area, storage and cooking inside	Rectangular form, two rooms on one floor, max. two floors, 2-3 houses share common courtyard, daily activities take place in the courtyard, storage and cooking inside, cattle shed provided near main house
	<b>Built and open spaces</b>	Built-up area, semi-covered verandah and open courtyard	Built-up area and open courtyard, semi-covered verandah may or may not be present	Built-up area, semi-covered verandah and open courtyard
	<b>Walls</b>	walls made of mud, mud plastered, decorated occasionally with traditional patterns made of rice paste	walls made of mud bricks, may or may not plastered	walls made of mud, mud plastered, decorated occasionally with traditional patterns made of rice paste
	<b>Openings</b>	Minimum openings, small in size, little or no ornamentation	Small openings, ornamented, different shape of openings provided	Minimum openings, small in size, no ornamentation,
	<b>Roof Profile</b>	Sloping covered with slate	Sloping covered with slate	Sloping covered with slate or thatch
<b>Socio-cultural</b>	<b>Occupation</b>	Agriculture	Merchant class	Agriculture
	<b>Dominant Caste</b>	Rajput	Sood	Sharma
	<b>Family Structure</b>	Joint family	Joint family	Joint family
	<b>Economic Status</b>	Moderate-Poor	Rich	Moderate-Poor

## 5. Conclusions

Role of climate as guiding factor to provide comfort is well known, but the presence of elements like courtyard and semi covered verandah in traditional houses throughout India irrespective of climate type

indicates that there is some other guiding force behind. Similarly, justification of some elements being guided by socio-cultural elements is more justifying. The study of traditional houses of selected villages in Kangra (H.P.), proves that the socio-cultural aspects of a community affect the choice of site, size of house, material and technology used, aesthetic elements and form of the house. The role of climate is vital but is limited as a modifying element. In present context, the house forms are based on climate factors. People will relate to the physical environments around them in better way if it suits their socio-cultural requirements are taken care. Therefore, we can learn from our time-tested knowledge systems and use the wisdom in our present and future houses to make them more suitable for our physical and societal requirements and achieve cultural sustainability in the built environment surrounding us.

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