

A Local Practices Brief
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1. INTRODUCTION

Spiti is a cold desert located in the Trans-Himalaya region in north-western India. It lies between north latitude $31^{\circ} 42'$ and $32^{\circ} 58'$, and east longitude $77^{\circ} 21'$ and $78^{\circ} 35'$; its area is 7,591 sq. km., and its population is 10,675 souls, or 1.4 persons per sq. km. (Census of India 2001). It has a mean elevation of about 4,570m. The temperature in winters falls to -30°C while summer temperature might touch 25°C . Rainfall in the region is very scanty, and snowfall occurs mainly in the winters. With an annual rainfall of about 17.7cm, Spiti is a typical mountain desert. There are three distinct geographic regions in Spiti:

- the valley of the Spiti river, or Spiti valley;
- the valley of the Pin river or Pin valley; and
- the high mountain regions located in the north and east of Spiti tehsil.

The Spiti valley is at places three kilometres wide. There is level land on either side of the river giving the appearance of terraces. This level land on which the villages are perched varies in width from fifty to more than a thousand metres. The total number of inhabited villages in Spiti are 81(D.S.O.Keylong, 2001). The villages are built around occasional springs or streams on these flat pieces of land. Villages consist generally of not more than a dozen to twenty households each, and are three to nine kilometres apart. The houses in Spiti are good example of the symbiotic relationship of man with his environment. The mud houses in the Spiti region have flat roofs and the locally available natural materials like mud, wood, scrub and stone, are used for construction. These traditional houses are the best suited for this cold desert region and are also environmentally sustainable.

2. SETTLEMENTS

The settlement pattern in Spiti is mainly **dispersed**. Most of the settlements in this region are on the **sun facing side** and the houses are located on the **south facing slope** of mountains. All the settlements in the entire Spiti valley are **wet point settlements**. In this region, water is a scarce resource and since agriculture is the mainstay of economy, water is required for cultivation. Most villages are therefore located along or near the *nallah* sides. Some villages are situated on rolling highland pastures as well, near some glacierfed stream. Proximity to the water source for meeting the daily needs as well as for irrigation seems to be the chief consideration although availability of construction material, the existence of sizable plots of land for agriculture and ample grazing area for the cattle, have played a dominant role in the selection of sites. Based on the location with respect to the river the target region can be categorised under three distinct types of settlements.

- a. Basins These settlements are located at river basins, at a height of about 20-50m above the basin. The basins are either spread on one side of the river or on both the banks. These are essentially flat tracts of lands but at a few places are also in the form of moderately sloped terraces. The banks are not too steep and water for irrigation can therefore be drawn directly from the river with the help of diversion channels, for eg., in Tabo in Spiti or in Jispa in Lahaul.
- b. Steep banks In the middle regions of the valleys, steep cut banks separate the villages from the river. Settlements are located at about 50-100m height above the river level. These villages depend on glacial melt for both drinking and irrigation needs, for eg., Kaza in Spiti, Khoksar in Lahaul. These differ from the basin settlements essentially due to the fact that they are located considerably above the river basin. Hence water needs are supplemented primarily by the natural springs and glacial melt.
- c. Highlands These include the highest settlements of the valley, more than half a kilometer above the river bed. Flat tracts of land on high mountains are the typical features of these kinds of settlements, although at places terraced fields also exist on moderately sloped hill faces. The river is completely inaccessible from these places. These settlements therefore have to depend solely on snowmelt for meeting their water requirements, for eg., Kibber in Spiti, Rashal & Gondla in Lahaul.

In all there are 113 settlements in Spiti, 32 of which are listed as uninhabited. Spread over 81 villages, 2,425 households average 30 households to each village. Actually, however, there are as many as 33 villages which have ten or less number of houses, and only a few have a large cluster of houses.¹ Some of the important villages - there are no towns - of Spiti are:

- Kaza, the headquarters of the Additional Deputy Commissioner of Spiti,
- Rangrik,
- Dhankhar, the traditional capital;
- Lalung,
- Hikkim,
- Kee,
- Kungri,

¹ Verma,V.(1997); "*Spiti: A Buddhist Land in Western Himalaya*", B.R.Publishing Corporation, Delhi. pg. 43 - 44

- Tabo, well known because it houses the world famous, nearly 1000 year old, Tabo monastery;
- Kaurik, yet another gate-way to Tibet;
- Kibber perched high at 4000m on rolling bare mountain top;
- Gue, the highest point in a side valley and
- Gette, pride of Spiti, situated at a height of 4,270m, the highest inhabited village in the world.

There are also seasonal settlements characterized by hardly one or two single room buildings. These summer settlements are surrounded by the small landholdings and the pasturelands usually located on the higher reaches; locally these summer settlements are called *Doghris*.

The layout of the villages is neither uniform nor does it answer to any planning concept (*see photo - 1*). The villages in Spiti have some common characteristic features like *chorten*, *tagoh*, *bara ghar* (*Khang Chen*) and *a gompa*. It is not essential for all villages to have a gompa; three to four villages may also share one common gompa. Generally the houses are built separate. Often their growth is haphazard and congested. They are built just anywhere in the village so that it is often difficult to find a path between them. The lanes or by-lanes are narrow and drainage is unknown.



Photo 1: Chichum village after the fresh snowfall

3. HOUSES

The rectangular mud houses of Spiti are almost homogeneous in size and shape and as mentioned, are located near sites where water is readily available and cultivable land also exists. Against the background of the bare mountains, the white-painted **mud houses** of Spiti are beautiful and eye-catching.

The houses in this cold desert region are made of mud as it is readily available, and the walls being a foot thick, act as good insulation against the severe winters. In the entire Himalayan region which is characterised by very heavy rainfall, the houses have sloping roofs. In the cold deserts of Ladakh, Lahaul, Spiti and Upper Kinnaur where precipitation is extremely low, however, the houses typically have **flat roofs**. Due to the five months of extreme winters with heavy snowfall, this region is usually cut-off from surrounding regions, therefore, the design of the houses is such that everything is available within the house in the winter season. Therefore, the houses have more than 8 to 10 rooms, which include not only the living room but the storage and cattle rooms as well.

In Spiti, most houses are **double storeyed**. The terrain and the paucity of suitable sites seem to have laid emphasis on multi-storeyed constructions. The heavy snowfall in winters leaves the ground covered with about 5-6 feet of snow, frequently covering the entrance at ground level; hence the double-storeyed houses. The foundation upto the plinth level is of random rubble stone masonry laid in mud mortar while rammed earth is used for the walls. The roofing is the traditional Spiti mud-roof on a wooden framework. The support to the ceiling (made of wood, scrub and branches) is given by wooden logs. The flooring is also of mud. Mud plaster with an external coating of lime wash is used for the walls. Local water resistant mud *toabh* is used on the wall exteriors, the exposed roof and for plastering the ceiling.

A house usually has a small central court which is surrounded on three sides by the building and closed on the fourth by a wall in which lies the main entrance to the house through a strong, though low, wooden doorway. A wooden ladder or stone stairs leads to the family apartments up above. The ground floor is usually meant for housing the cattle and sheep which are typically, the only form of movable wealth and property. There is, besides, space for fodder and a spacious room (*gunsas*) for the family to pass the winter in, in close and intimate proximity to their animals, whose collective body heat serves to provide warmth. These houses have an internal arrangement for the privy (dry toilet) which is of the local variety. The system is to have a rectangular hole in a small room locally called *Chaksa or dry toilet*, which is always in the upper storey. The waste falls into an enclosure on the ground away from the main entrance to the house. After use, mud is thrown down to accelerate decomposition. This helps make a good organic manure for the fields.

The roof is mainly used for keeping the fodder for cattle and drying the dung which is used as a fuel in traditional chulhas. The traditional, iron chulhas, locally known as *chakthap*, are a common feature in Spitian houses.

In Spiti, each house has another small house attached to it. The head of the family resides in the main house, locally known as *Bada Ghar (Khang Chen)*. The small house attached to the main house, locally known as *Chota Ghar (Khang Chung)*, is occupied generally by the father of the head of the family. According to Spiti customs, when the eldest son marries, he becomes the head of the family and the father retires from that position and goes to live in the *Chota Ghar* separately, which also has a piece of land for the sustenance of the occupant.

Bara Ghar, literally meaning bighouse/ khangchen, are the original inhabitants of a village. Also they are the major land owners. With the passage of time, and increase in population, the bara ghars gradually split into a large number of small houses i.e. chota ghar. As a result of this fission, the present village structure, consisting of a fixed number of big houses and an ever increasing number of small houses, has emerged.

Chota ghar means small house, separated from Bada Ghar. When the eldest son marries, he assumes the head ship of the family and the father retires and goes to live in the small house, which is called khang-chung . The younger brothers and sisters also move along with the parents. The Chota Ghar gets a very limited share of land and property, which has to be returned to the Bada Ghar after the demise of the parents.

In the past few years, with greater accessibility to the urban towns of Shimla, Kullu and Manali, from where the Spitians have access to the cement and other pucca house construction material, there has been a change in the construction style of the houses in Spiti. The economically well-off families have become interested in building cemented houses; there is no other change in the shape and size of the houses though. The buildings housing the offices of the district administration and the private rest houses have begun to be constructed with inclined roofs in keeping with other parts of the Himalayas.

4. BUILDING MATERIAL

The houses in Spiti use primarily the natural renewable materials available locally, viz, mud, wood, scrub and stones, as building material for construction. The foundation of the house is usually of stone, the walls are made of mud and the ceilings are of wood, branches, scrub and mud - *see fig.1*

Based on availability, the building material may be divided into three categories:

1. *Ubiquitous* - the material which is available at all places in Spiti, e.g., scrub, mud etc.;
2. *Localized* - the material which is available only at certain specific locations in Spiti, e.g., willow, clayey soil, etc.; and
3. *Rarity* - the material that is rare and difficult to source in Spiti, e.g., wooden logs, etc.

Table 1: Building materials and its usage

<u>Local name</u>	<u>English Name</u>	<u>Availability</u>	<u>Usage</u>
<i>Makhdung Ka &</i>	wooden logs of poplar (maksa)	Maney, Tabo & Kinnaur (<i>localized</i>)	placed horizontally over the <i>Kaje</i> to support the ceiling
<i>Phurdung</i>	wooden logs of poplar (maksa)	Maney, Tabo & Kinnaur (<i>localized</i>)	placed over the <i>Makhdung</i> , it helps in the formation of the ceiling
<i>Thillu</i>	stems of willow & seabuckthorn (churchung)	Lossar and Lalung (<i>localized</i>)	fills the voids created by the <i>Makhdung & Phurdung</i>
<i>Thapp</i>	branches of willow and scrub (penma & ombu)	(<i>ubiquitous</i>)	spread over the <i>Thillu</i> to fill the gaps in the <i>Makhdung & Phurdung</i>
<i>Dhambuk</i>	mud	(<i>ubiquitous</i>)	spread to plaster the empty spaces created because of the interlocking of ceiling <i>Makhdung, Phurdung, Thillu and Thapp</i>
<i>Tooah</i>	clayey soil	riverside (<i>localized</i>)	water resistant mud used for plastering the roof; also spread over the <i>Dhambuk</i> ; used for plastering the outside walls
<i>Ka & Kaje</i>	wooden logs of eucalyptus	Pin valley (<i>rarity</i>)	placed vertical in the centre of the room to support the ceiling
<i>Penma</i>	scrub	(<i>ubiquitous</i>)	painted black for decoration and placed on the edges of the roof to protect the walls from snow

<i>Chak</i>	red soil	Lidang (rarity)	used for painting the wall on the upper part of the house in the form of a strip for decoration
<i>Kirsi</i>	limestone	(localized)	used for white-washing the building from the outside

Source: Data collected by Pragya between August to November 2003.

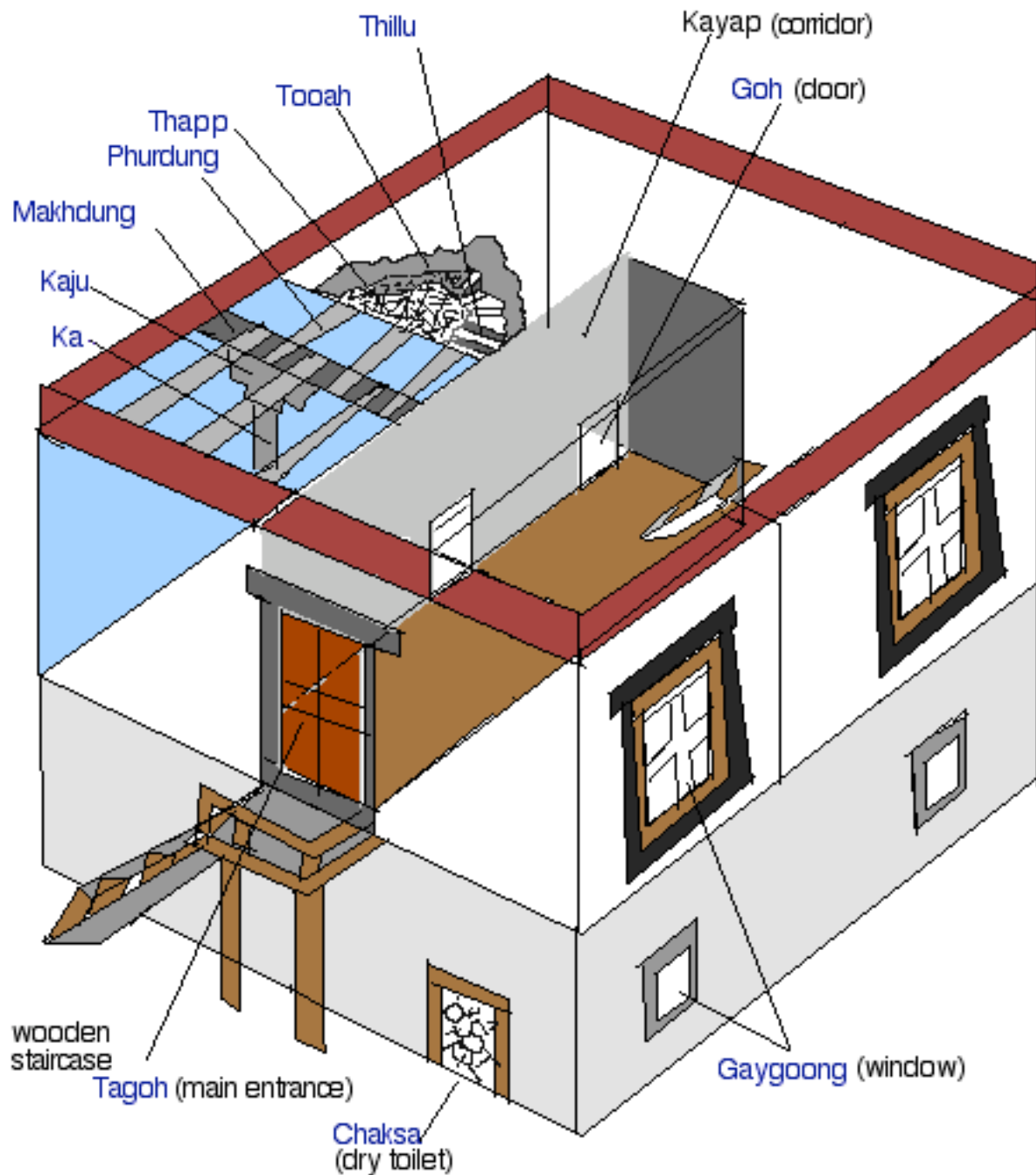


Fig. 1 Three dimensional view of the Spitian house



Photo 2: Internal view of the Spitian house, showing the Ka and Kaje supporting the ceiling.

5. SITE CHARACTERISTICS

Proximity to the water source for meeting the daily needs as well as for irrigation seem to be the chief considerations in site selection, although the existence of sizable plots of land for agriculture and ample grazing area for the cattle have also played a dominant role in the selection of sites. In the past, the locals used to consult a *lama* for site selection. The *lama* would visit the site and throw the dice on the ground and refer to his *pothi* and if the figure on the dice matched with the figures in the *pothi*, the site was selected. If the numbers on the dice did not match with the numbers on the *pothi*, then the same process would be repeated at a different site. This type of practice was followed in the past as a lot of land was available. But nowadays due to population pressure and expansion of agriculture there is a shortage of land and the land prices are also high. For example, in Kaza there is not much land available and therefore people are constructing the houses wherever the land is available. Therefore the traditional procedure of site selection is vanishing and is only practiced in the villages which are sparsely populated and where land is easily available.

Site selection is followed by the performing of certain rites on the land by a *lama*. This ceremony is locally called *Risa*.

6. CONSTRUCTION METHODS

The construction of traditional houses is a part of the culture of region and practiced by everyone and no special skills are required. Usually the family members and local labour build the house. The services of masons and carpenter are obtained from wherever they are available, perhaps some neighbouring village. The houses are usually constructed in summers due to the cool climate, accessibility, and availability of scrub and labour. The construction work begins with the filling of the foundation with stone and mud and it is raised to almost 2 ft. height from the base of the foundation. Stones broken on the belly of a *Buzhen* (a group of *lamas* from Pin valley renowned for their physical feats) are usually put in the foundation of the houses, as this is believed to be auspicious for the house.

The walls are made with the help of rectangular planks locally called *Gheyehhing*, which are placed on either sides of the plinth and filled with moist earth mixed with small stones and then pressed with the leg/ flat wooden plank as shown in *fig.2*. This process continues until the walls are raised to the desired height. The doors and windows are fixed as the construction progresses.

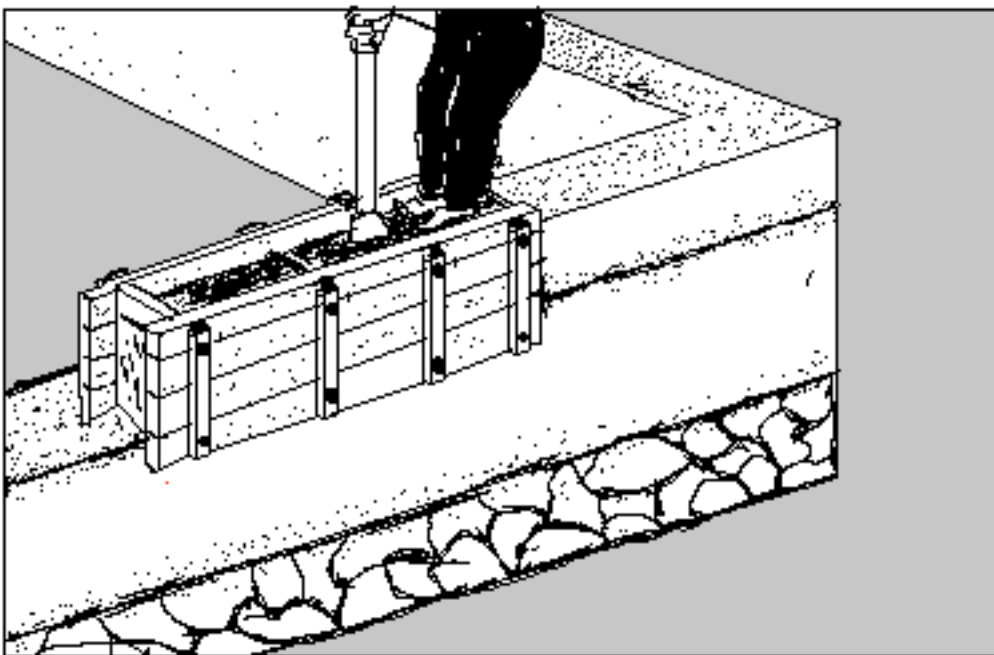


Fig. 2. Construction process for raising the walls

Then the *makhdung* is placed horizontally on the raised wall to support the ceiling. The *phurdung* is placed in a net like pattern over which the *thilu*, *thapp* and *dhambuk* is spread. To make the ceiling strong and water resistant, it is plastered with mud called *tooh* which is available near the riverside. To support the ceiling from the ground, the *ka* and *kaze* are placed in the centre of the room. The same process is repeated to raise the upper storey. The roof of the house is covered on all its edges with *penzuil penma* (scrub) to protect the walls against the snow. Then the entire building is white washed with *kirsi* (limestone). For giving a better appearance to the house, the top of the house is painted red with *chak* (red soil) in a strip like pattern and the walls bordering the window are painted black with *sheljor* (black mud). The floor is plastered with a mixture of mud, dung and water- .see *Table 1*.



Photo 2. A typical Spitian house in Dhankhar village

7. INTERIORS

Due to the five months of extreme winters, this region is usually cut-off from the surrounding regions. Therefore the design of the house is such that everything is available within the house in the winter season. The houses in Spiti are comfortable. There are usually eight to ten rooms in a Spitian house. The general layout of a Spitian house is given in the *appendix 1 and 2*.

The rooms in a typical Spitian house are as follows:

<u>Local Name</u>	<u>Use</u>
1. <i>rah</i>	Cattle shed (yak & cow) in winters
2. <i>gunsa</i>	Living room used in winters (ground floor)
3. <i>chalak porsa</i>	store room and also use for keeping the skins, horse material and tidy clothes
4. <i>dongkhang</i>	guest room
5. <i>yorsa</i>	summer room-cum-kitchen
6. <i>chokhang</i>	temple
7. <i>khatuk</i>	terrace/ open court
8. <i>kayap</i>	long corridor/ lobby
9. <i>chaksa</i>	dry pit
10. <i>chimbu</i>	store room for local wine (ground floor)
11. <i>lugra</i>	for keeping sheep & goat (outside the house)
12. <i>tah</i>	for keeping the fodder (ground floor)
13. <i>khaltak</i>	courtyard

Source: Data collected by Pragya between August to November 2003

All houses have a narrow and dark lobby/corridor both in the ground and the upper floors, locally known as *kayap*, which lead to the rooms. The upper storey (each storey is 7 to 8 feet high) is reached from an outside stone/wooden staircase and also from an inside winder which opens into a tiny lobby upstairs. The characteristic feature of the upper-story, is the open court or *khatuk* which faces south and catches all the summer and winter sun. There are three fairly large rooms of different sizes which are used in summer by the family. One is the living room cum kitchen (*yorsa*) and the second is the guest room (*dongkhang*). The third room is set apart as the place of worship (*chokhang*) and it is the cleanest and best looked after part of the house. The walls are decorated with *thankas* or holy pictures. It is furnished with images of the Buddha, other deities and religious books, placed in a wooden showcase. Before these are laid out the prayer wheel, bell and other items of worship. About half a dozen little brass cups filled with water are arranged at the feet of the images besides some brass lamps, one of which is kept burning night and day with yak butter. The upper storey receives light through windows which are nowadays quite big in size; the doors are narrow and low. The upper storey also has a dry toilet.

The ground floor has a winter living room which is called *gunsa*, a guest room (*dongkhang*), a storeroom (*chalakporsa*) for storing grains - in large cylindrical containers, - animal hide for use in shoes, equestrian gear, smoked meat, etc., and another store room (*chimbu*) for keeping the local wine, *chang* and *arak*.

The most common feature of a house (and a unique feature of houses in Spiti) is the provision of internal and external space for the cattle owned by the family. Almost universally, the ground floor is used exclusively for keeping the cattle in winter. The room is locally known as *rah* and it is usually attached to the kitchen cum living room (*gunsa*) so that the cattle get warmth in the winters; fodder

is stored in another room called the *tab*. In summers the cattle are kept in a walled (with mud walls of 2 ft. to 4 ft.) space outside the house, usually on the sun facing side, which is locally called *lugra*.

8. DECORATION

The houses in the Spiti region are eye-catching, painted white with red and black borders against the background of the bare, golden mountains. The houses in Spiti are simple, both from the inside and the outside. The external walls of the houses are white-washed, and the top of the house is painted red in a band like pattern and the walls bordering the window are painted black, for beautification. The roof of the house is covered on all edges with *penzui*, neatly arranged and coloured black. Apart from this, the great layers of brush-wood, faggots and fodder are piled high on the roof to last through the long winter; on a few roofs one would find a black yak's tail fixed like a flag to ward off evil spirits. Inside the house, the rooms *yorsa*, *gunsa* and *chokhang*, are the only rooms with some decoration. The most common feature of the *gunsa* and the *yorsa* is the traditional *chulha* called *chakthap*, which is placed in the center of the room and is used for cooking as well as heating the room. The seating arrangement is on the floor, on carpets spread on a long, flat wooden frame along the edges of the room, with the traditional, low, elongated tables called *chokse* placed all along in front. A couple of walls are typically lined with wooden racks used for keeping the utensils and the cutlery. Nowadays, the modern day cooking gas is also used and it is usually placed over a low bureau.

9. CONCLUSION

The Spitian mud houses are best suited to this cold mountain desert. Houses in Spiti are a good example of the symbiotic relation of humans with their environment. However, even Spiti has not escaped the effects of modernization. There has been a gradual shift from traditional methods of construction to modern ones. A number of new houses have now been made of concrete, which has unfortunately, also meant increased energy bills. As the region experiences cold winters (prevailing for nearly half the year, the mercury dipping as low as 30 degrees below freezing point), cement buildings become extremely cold. Cement buildings are not energy efficient as compared to the traditional houses that require low heating. This is an important issue in this region where fuel is scarce and expensive. Since, like any desert, the temperatures swing between extremes of sub-zero levels in winter, rising to 30 degrees Centigrade in summers, the cemented structures are unable to take the environmental strain and develop cracks. This also necessitates much higher maintenance costs than traditional structures.

Sustainable and feasible construction techniques that blend ancient wisdom with modern features need to be adopted for the region. The use of glass in houses - which has been tried in Ladakh - is a potentially useful development. Not only does it incorporate passive solar construction technologies for improved energy efficiency, it also helps reduce the usage of the already scarce fuel wood.



*Photo 4: A house in Bhur village
Pin valley*

Salient features of houses in Spiti

- use of locally available material;
- energy efficiency;
- use of local skills & manpower;
- non-polluting and environmentally sustainable;
- responsive to local needs; and
- low cost

APPENDIX - 1

GLOSSARY

1. Spiti It is the Tehsil of Lahaul and Spiti district of Himachal Pradesh, with its headquarters at Kaza.
2. Kinnaur It is the tribal district of Himachal Pradesh, is about 250 km away from Shimla, the capital of Himachal Pradesh, is about 250 km away from Shimla and is situated on the NH-22 (Hindustan Tibet Road).
3. Nalah Glacial melt streams/ rivulets are locally called Nalah.
4. Pothi Religious text.
5. Chorten Buddhist holy structure for offering prayers
6. Tagoh Entrance/ main gate to a village and a house is called Tagoh.
7. Gompa Local name for monastery.
8. Thanka A *thanka* is a sacred painting on a piece of specially prepared cloth.
9. Buzhen The descendants of the married monks of the Nyingma sect, *Buzhens* are a community of preachers, daredevil performers, harlequins and wandering minstrels.

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