

RESOURCE POTENTIALS OF SPITI: THE COLD MOUNTAIN DESERT OF HIMACHAL PRADESH

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ABSTRACT

This paper embodies the socio-economic set up and the related environmental issues in Spiti Valley—the cold mountain desert of Himachal Pradesh. It suggests some ways to carefully utilize this fragile ecosystem and some safeguards against further destruction.

The State of Himachal Pradesh, otherwise well known for its lush green valleys, has some regions under arid and sandy mountains. Out of the state's total geographical area of 55,673 sq km about 10,000 sq km (18% of the total area) is totally barren, rugged and treeless. This arid zone starts from Baralacha pass (16,000 ft) in Lahaul and after covering the entire Spiti valley in the district of Lahaul and Spiti, it extends upto Kanam in Pooh sub-division of district Kinnaur (Kashyap 1989). The valley of Spiti covers an area of 7,589 sq km (14% of the total area) and is encircled by numerous mountains with altitudes ranging from 6,100 to 7,000 m.

The name Spiti is locally pronounced as 'Piti', meaning a middle province in the Tibetan dialect. The British took possession of Spiti in 1846 and a hereditary chieftain the 'Nono' was entrusted with the powers of revenue collection and trial of minor criminal cases. In 1941, Spiti alongwith Lahaul, was made a separate tehsil and then a district in 1960 (Negi 1985).

In this paper an attempt has been made to highlight the socio-economic status of the 'Piti People' and in turn their interactions with the environment of this unique valley. Some suggestions have also been outlined to make the afforestation programme more effective and meaningful to ensure community participation to the maximum possible extent thereby ameliorating the living standards of the local populus.

Physiography, geology and climate

Spiti valley is situated between 31°42' and 33°N latitudes and 77°37' and 78°35' E longitudes, adjoining Tibet on its eastern border and Ladakh on its north. This flat and broad valley is mainly irrigated by river Spiti which originates from a

glacier near Kunzom La at 5,000 m. However, small tributaries at many places join the main river before it empties into the river Sutlej at Khab in Distt. Kinnaur. The altitude of the main valley varies from 3,120 m (at Sumdoh) to 5,000 m near Kunzom La with the higher valley slopes covered with alpine pastures (Fig 1). With the exception of these pastures the mountain slopes are bereft of any other kind of vegetation except for some herbaceous flora which dot these mountains at places.

Spiti is well known for its various geological series and for ammonite fossils. It was supposedly a part of the Tethys sea during pre Cambrian times.

A short summer (June-August) and long freezing winters (September-May) are characteristic of the valley. During peak winter the minimum air temperature may be as low as -30°C when the local people have to stay indoors for at least six months at a stretch. The people as usual spend the winter months sitting around the fire at night and weaving woolen clothes on their looms during the day. The annual rainfall, if any varies from 5-10 mm. June/July are the hottest months but the day temperature never exceeds 30°C . The weather data for the year 1988-89 (Table 1) signifies the general climatic condition of the region.

Soil

Most of the soils in Spiti are categorised as 'Alpine swards' which are generally too shallow and dry to support any plant life. The top soil usually contains partly decomposed plant parts. Glaciers and avalanches bring down enormous soil masses to the lower slopes or in the river Spiti. The soils in the lower slopes of the mountains have comparatively more depth and the land there is fertile for agricultural/horticultural crops. The principal soil types of the region are clayey loam, silty loam, silty clay loam, loamy and sandy loam.

The available nitrogen and phosphorus contents of the soil vary from medium to high. The soils are alkaline and the organic matter content is very low owing to the absence of herbaceous vegetation and partial decomposition due to adverse climatic conditions.

Soil conservation is one of the major problems of Spiti. According to an estimate, 80 per cent of the total silt in the Sutlej river is fast filling up the Govindsagar lake of the Bhakra complex. Besides glacial action as discussed earlier, wind erosion and repeated road constructions are also playing havoc in the absence of green cover. The Bhakra Beas Management Board's study on siltation showed that the maximum load of silt in Spiti river was during May to August, the peak season when the glaciers melt and avalanches slide down the mountains.

A number of protection walls erected on the critically eroded areas deflecting spurs and check dams play significant roles in checking soil erosion. As per official records about 700 ha of land have been brought under the soil conservation programme.

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place these days and sometimes the parents even pay the penalty ranging from Rs. 1000/- to Rs. 7000/- for their son's failure to join monastery. The religion of the valley is Buddhism which was introduced here around the 8th century by Padam Sambhav.

One major disturbing factor is the occurrence of community clashes between the people of Khang-ch'en' and Khang-ch'ung'. The 'land to the landless' scheme introduced by the Government is apparently causing some confusion in the minds of the two categories of people regarding their respective rights to natural resource utilization.

Before the advent of the winter season, caravans of men, women and beasts set out to collect dung cakes from the alpine pastures where the animals are allowed to graze during summers. On their way back they uproot rather than lop, the whole vegetation along the mountain slopes as more and more of stacking of the fuel wood on the roof tops is a status symbol for the villagers. This is done despite Govt. supply of fuelwood, coal and kerosene on subsidized rates.

The economic conditions of the people of Spiti are unsatisfactory. Agriculture continues to be principal occupation of the people. In Spiti less than 1 per cent of the area is under cultivation and usually one crop is harvested in a single year. The major crop and the staple food of the area is barley. Mustard is also grown successfully but on a smaller scale. The small and marginal farmers of the area get 50 per cent subsidy from project and block agencies to grow improved varieties of peas, mustard, onion, beans, cabbage, tomatoes and potatoes with the guidance of the Vegetable cum-Potato-seed Development farm at Lari, near Tabo. All these crops can be grown successfully upto Kaza (3,810 m). Unfortunately fish is uncommon in the rivers and streams of Spiti. Lack of food for fish may be the reason. The state government is initiating some programme to boost the economy through fisheries. The number of livestock is also a symbol of economic status of the people. Hence, the emphasis now is on qualitative improvement of the livestock in keeping with the resources of the area. The main domestic animals are yaks, ponies, donkeys, cows, dzos (Cross between yak and cow), sheep and chigu (Pashmina goats). There were only 14619 animals (1978 Live stock census) in Spiti. In summers, these animals feed in the alpine pastures while in winters they thrive on the limited fodder stocks available. At times they are seen consuming the bark of poplar and salix trees causing great damage to this wealth. A fodder multiplication farm has been set up at Tipta where a variety of forages viz., *Medicago sativa*, *Trifolium pratense* and *Lolium perenne* are being raised successfully. A solar photo-voltaic pump draws water through a 2" diameter pipe from Spiti river to irrigate this seed farm. This scientific technique has been introduced here and in this state for the very first time. Because of their indolence, general poverty, illiteracy, barrenness of the area, lack of resources and limited working season, the people of Spiti are mostly poor and backward.

Forest wealth and desert development programme

The forest wealth of Spiti is characterised by the presence of only a handful of tree species namely *Juniperus macropoda*, *J. semicarpifolia*, *Salix fragilis*, *S. alba* and *Populus alba*. Some trees of *Chuli* (*Prunus* spp.), *Changma* (*Salix* spp.) and *Mall* (*Poplar* spp) are grown by the inhabitants to fulfil their needs of food, fuel and fodder to a certain extent.

The available shrubs, which are mostly xerophytic in nature, are used for fencing and fodder, and as fuel when they become dry. The common shrubs are; *Hippophae rhamnoides*, *Rosa webbiana*, *Ephedra gerardiana* and few species of *Caragana*, *Lonicera* and *Cotoneaster*. The grasses recorded from this valley include *Agropyron* sp., *Eragrostis* sp. and *Poa partensis*.

Capparis spinosa, growing from the previous year's root stocks, is used as a vegetable at the time of leaf sprouting. Its creeping branches spreading upto 1 m or so can be used as good soil binders in these eroded mountains. Its flowers taste sweet and their sap is enjoyed by the children. *Trigonella* sp. also has food value and is eaten all over the valley. In 1977 a working group was set up by the Planning Commission to evolve a strategy to arrest the spread of desertic conditions here with main emphasis on irrigation, afforestation, community plantation, fodder development, soil conservation, animal husbandry and fishery etc. under the banner of the Desert Development Programme (DDP) of the Govt. of India. The programme is still continuing but now the plantations and other activities have been handed over to the respective departments of the state. Major thrust was given to the plantation of *Poplar* and *Salix* spp. which had shown quite encouraging results. The recent DDP plantation at village Sheigo, near Kaza where about 56,000 cuttings were raised both in summer and winter had come up excellently. In the higher villages of Kiato, Hansa and Losar beyond Kaza (3,980 to 4,079 m) *Salix fragilis* is being planted and the plantations are showing promising results. The area is slowly becoming greener and its people prosperous through the impact of DDP.

Some constraints and suggestions

The massive and sudden operations by the project authorities but without consultation of local population were watched with curiosity often leading to resistance. Educating the tribal masses regarding consequences of desertification, standardization of package measure to develop suitable planting models of agro-forestry, agro-silvicultural cum pastoral nature adoption of local species can help in rapid amelioration of economic status of the individuals.

Hence, multidisciplinary integrated approach coupled with the effective participation of the local community appears to be the only possible way out in mitigating the hardships of the tribals in greening these cold mountain deserts in particular.

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